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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 16, 1983 Volume 1033 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,296,806, Re. S.N. 482,323, Filed Apr. 4, 1983, Cl. 166/120, HIGH TEMPERATURE WELL PACKER, Donald F. Taylor, et al., Owner of Record: *Otis Engineering Corp., Carrollton, Tex.,* Attorney or Agent: Thomas R. Felger, Ex. Gp.: 356

4,341,391, Re. S.N. 496,399, Filed May 20, 1983, Cl. 273/422, REPLACEABLE L-SHAPED BLADE ARROWHEAD, Jeffery J. Anderson, Owner of Record: *Inventor,* Attorney or Agent: George H. Mitchell, Jr., Ex. Gp.: 334

4,352,904, Re. S.N. 496,938, Filed May 23, 1983, Cl. 524/292, MOULDING RESINS, Edward J. Deyrup, Owner of Record: *E. I. DuPont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Gary A. Samuels, Ex. Gp.: 144

4,364,424, Re. S.N. 480,769, Filed Mar. 31, 1983, Cl. 150/1, END WALL CLOSURE FOR BULK MATERIAL TRANSPORT BAG, Peter J. Nattrass, Owner of Record: *Bulk Lift International, Carpentersville, Ill.,* Attorney or Agent: Thomas E. Dorn, et al., Ex. Gp.: 241

4,371,576, Re. S.N. 503,206, Filed June 10, 1983, Cl. 428/92, HOT MELT ADHESIVE BONDED PILE, Greville Machell, Owner of Record: *Milliken Research Corp., Spartanburg, S.C.,* Attorney or Agent: Terry T. Moyer, Ex. Gp.: 164

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,373,058, Reexam. No. 90/000,422, Requested: July 18, 1983, Cl. 524/705, POLYMER CONCRETE COMPRISING FURFURYL ALCOHOL RESIN, Lowell C. Horton, Owner of Record: *The Horton Co., Gulf Breeze, Fla.,* Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 142, Requester: Quaker Oats Chemicals, Inc., Chicago, Ill.

4,321,918, Reexam. No. 90/000,421, Requested: July 15, 1983, Cl. 128/1.1, PROCESS FOR SUPPRESSING IMMUNITY TO TRANSPLANTS, William T. Clark, Owner of Record: *Inventor,* Attorney or Agent: James H. Littlepage, Ex. Gp.: 330, Requester: William T. Clark, New Orleans, La.

4,287,739, Reexam. No. 90/000,417, Requested: July 11, 1983, Cl. 72/34, METHOD FOR PRODUCING A HELICALLY WOUND PIPE HAVING A PREDETERMINED DIAMETER, George L. Campbell, Owner of Record: *Syracuse Tank & Mfg. Co., Phoenix, Ariz.,* Attorney or Agent: Cahill, Sutton & Thomas, Ex. Gp.: 320, Requester: Owner

4,264,307, Reexam. No. 90/000,420, Requested: July 15, 1983, Cl. 433/166, DENTAL REDUCING TOOL, Siegmund A. Neuwirth, Owner of Record: *Siegmund A. Neuwirth, London, United Kingdom,* Attorney or Agent: Bernard Malina, Ex. Gp.: 333, Requester: Syntex U.S.A., Inc., Palo Alto, Calif.

4,019,057, Reexam. No. 90/000,419, Requested: July 14, 1983, Cl. 250/375, DEVICE FOR DETERMINING THE SPATIAL DISTRIBUTION OF RADIOACTIVITY OF AN OBJECT, Stanley Bram, Owner of Record: *Etablissement Declare d'Utilite Publique dite; Institute Pasteur, Paris, France,* Attorney or Agent: James & Franklin, Ex. Gp.: 250, Requester: Laboratorium Prof. Dr. Berthold Calmbacher, Postfach 160, Fed. Rep. of Germany

PATENT NOTICES

Certificates of Correction for the Week of Aug. 16, 1983

D. 263,825	4,353,698	4,377,303	4,384,977
3,511,836	4,360,717	4,378,826	4,385,311
3,963,976	4,361,202	4,378,855	4,385,349
3,969,774	4,362,784	4,379,068	4,385,435
4,214,424	4,363,542	4,379,123	4,385,657
4,243,849	4,363,904	4,379,181	4,385,957
4,244,935	4,364,824	4,379,346	4,386,257
4,248,951	4,364,837	4,379,779	4,386,282
4,256,500	4,364,944	4,380,109	4,386,303
4,289,757	4,366,317	4,380,137	4,386,339
4,305,939	4,366,779	4,380,240	4,386,612
4,309,299	4,367,294	4,380,418	4,386,744
4,321,371	4,368,245	4,380,636	4,386,979
4,322,951	4,369,564	4,380,814	4,387,009
4,326,863	4,369,730	4,381,509	4,387,129
4,330,160	4,370,285	4,381,812	4,387,408
4,330,328	4,370,323	4,382,037	4,387,616
4,332,690	4,370,736	4,382,171	4,387,923
4,334,201	4,370,742	4,382,362	4,388,116
4,334,703	4,371,485	4,383,160	4,388,231
4,341,943	4,373,193	4,383,269	4,388,457
4,342,702	4,374,430	4,383,514	4,388,992
4,344,732	4,374,625	4,383,885	4,389,191
4,347,386	4,375,301	4,384,046	4,389,269
4,349,955	4,375,426	4,384,062	4,389,544
4,350,297	4,375,547	4,384,260	4,389,560
4,351,042	4,376,021	4,384,314	4,389,812
4,351,369	4,376,922	4,384,671	
4,353,628	4,377,017	4,384,716	

Disclaimers

3,675,218.—*Robert F. Sechler,* Wappingers Falls, N.Y. INDEPENDENT READ-WRITE MONOLITHIC MEMORY ARRAY. Patent dated July 4, 1972. Disclaimer filed June 20, 1983, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to claims 1-9 of said patent.

4,166,479.—*Thomas H. Cleavenger,* Chicago, Ill. BLIND LINER FOR SERVICE PIPES. Patent dated Sept. 4, 1979. Disclaimer filed May 19, 1983, by the assignee, *Cleavenger Associates, Inc.*

Hereby enters this disclaimer to claims 1-4, inclusive of said patent.

4,213,807.—*Wojciech Rosnowski,* Summit, N.J. METHOD OF FABRICATING SEMICONDUCTOR DEVICES. Patent dated July 22, 1980. Disclaimer filed May 16, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2, 11 and 14 of said patent.

4,338,452.—*Allen S. Katner,* and *Stephen J. Bogard,* Indianapolis, Ind. 1-AND 2-(1-ALKYL-1H-TETRAZOL-5-YL-METHYL)-1H-TETRAZOL-5-THIOLS AND 1-CYANOMETHYL TETRAZOLE-5-THIOL. Patent dated July 6, 1982. Disclaimer filed June 13, 1983, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to claim 7 of said patent.

4,388,150.—*Olof Sunden,* Thonon, France; *Per G. Batelson,* Lilla Edet; *Hans E. Johansson,* Kungalv; *Hans M. Larsson* and *Per J. Svending,* Gothenburg, Sweden. PAPERMAKING AND PRODUCTS MADE THEREBY. Patent dated June 14, 1983. Disclaimer filed June 23, 1983, by the assignee, *Eka Aktiebolag.*

The term of this patent subsequent to May 31, 2000, has been disclaimed.

Disclaimers and Dedications

4,106,477.—*Sheldon L. Feld,* Jamaica, N.Y. THERAPEUTIC SELF-GENERATING MOIST HEAT PAD. Patent dated Aug. 15, 1978. Disclaimer and Dedication filed June 23, 1983, by the assignee, *Chem-E-Watt Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

4,338,359.—*Mark O. Kestner,* Mendham, N.J. METHOD OF FACILITATING LOW TEMPERATURE DISCHARGE FROM A CONTAINER OF PARTICULATE MATERIAL. Patent dated July 6, 1982. Disclaimer and Dedication filed June 13, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
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Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
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	Dallas Public Library	(214) 749-4176
Washington	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Wisconsin	Seattle: Engineering Library, University of Washington	(206) 543-0740
	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

AUGUST 16, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,208,747 (114th)

PASSIVE DOSING DISPENSER EMPLOYING TRAPPED AIR BUBBLE TO PROVIDE AIR-LOCK

Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

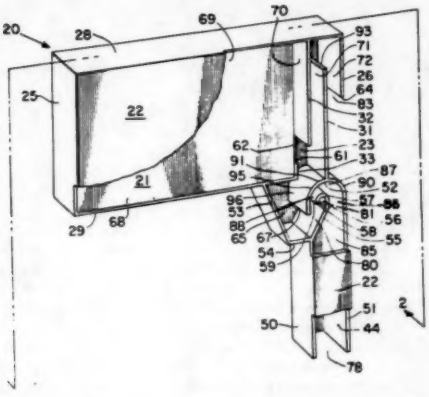
Reexamination Request No. 90/000,266, Oct. 12, 1982.

Reexamination Certificate for Patent No. 4,208,747, issued Jun. 24, 1980, Ser. No. 2,524, Jan. 11, 1979.

Continuation-in-part of Ser. No. 897,469, Apr. 18, 1978, abandoned. This application Oct. 12, 1982, Ser. No. 2,524

Int. Cl.³ E03D *9/02, 9/03;* **F04F** *10/00;* **B65D** *47/10*

U.S. Cl. 4—228



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–21** is confirmed.

1. A passive dosing dispenser for containing a quantity of a solution isolated from a body of liquid in which said dispenser is immersed and for causing a predetermined dose-volume of said solution to issue from said dispenser in response to the level of said body of liquid being lowered from a first elevation to a second elevation, said dispenser comprising:

a. an internal reservoir for containing a quantity of said solution;

b. liquid syphoning means in fluid communication with said reservoir for conveying a predetermined dose-volume of said solution from said reservoir into said body of liquid in which said dispenser is immersed in response to the level of said body of liquid being lowered from said first elevation to said second elevation, said syphoning means including passive means for providing a first air-lock in the path of fluid communcation between said reservoir and said syphoning means when said dispenser is immersed in said body of liquid; and

c. an air vent in fluid communication with said reservoir, said air vent including passive means for providing a second air-lock in the path of fluid communciation between said reservoir and said air vent when said dispenser is immersed in said body of liquid to a depth sufficient to block said air vent, whereby said first air-lock and said second air-lock serve to isolate said solution from said body of liquid until such time as said body of liquid is lowered from said first elevation to said second elevation.

12. A passive dosing dispenser for containing a quantity of a solution isolated from a body of liquid in which said dispenser is immersed and for causing a predetermined dose-volume of said solution to issue from said dispenser in response to the level of said body of liquid being lowered from a first elevation to a second elevation, said dispenser comprising:

a. an internal reservoir for containing a quantity of said solution;

b. liquid syphoning means in fluid communication with said reservoir for conveying a predetermined dose volume of said solution from said reservoir into said body of liquid in which said dispenser is immersed in response to the level of said body of liquid being lowered from said first elevation to said second elevation, said syphoning means including passive means for providing an air-lock in the path of fluid communication between said reservoir and said syphoning means when said dispenser is immersed in said body of liquid; and

c. an air vent in fluid communication with said reservoir, said air vent extending above said first elevation of said body of liquid when said dispenser is immersed in said body of liquid, whereby said air-lock and said air vent serve to isolate said solution from said body of liquid until such time as said body of liquid is lowered from said first elevation to said second elevation.

B1 4,332,282 (115th)

MEANS AND METHOD OF RECLAIMING CRANKCASE OIL

Roger W. Strange, 11510 Poblado, San Diego, Calif. 92127

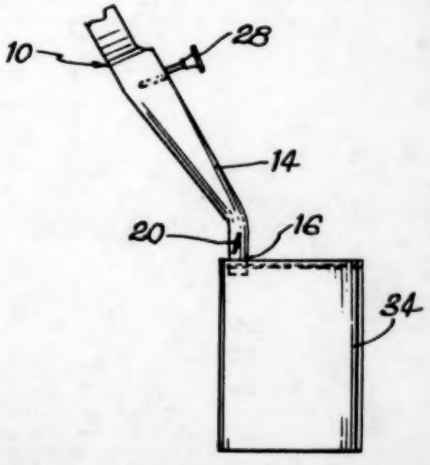
Reexamination Request No. 90/000,248, Aug. 30, 1982.

Reexamination Certificate for Patent No. 4,332,282, issued Jun. 1, 1982, Ser. No. 186,678, Sep. 12, 1980.

Filed Aug. 30, 1982, Ser. No. 186,678

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–6 having been finally determined to be unpatentable, are cancelled.

[1. An oil changing kit comprising:
(a) a flattened open-topped container;
(b) a funnel extending from one side of said container and communicating with the interior thereof and defining a partial lid for said container extending out over the edge of said open-topped container and terminating in a straight edge perpendicular to the direction of flow in said funnel to catch otherwise spilled oil when said container is tilted toward said spout, whereby said container can be filled from a crankcase and drained into oil cans through said funnel; and
(c) said funnel having a spout dimensioned to be inserted partially into a pouring hole punched into the top of an oil can, and having a first valve recessed from the end of said spout sufficiently to permit the spout to be partially inserted into a hole in an oil can.]

B1 3,743,260 (116th)
ANTI-POLLUTING WASTE COLLECTOR FOR A BURN TABLE

Mark M. Alleman, Aurora, and Rodger L. Marx, Oswego, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Reexamination Request No. 90/000,165, Feb. 22, 1982.
Reexamination Certificate for Patent No. 3,743,260, issued Jul. 3, 1973, Ser. No. 201,083, Nov. 22, 1971.
Filed Feb. 22, 1982, Ser. No. 201,083
Int. Cl.³ B23K *7/00, 7/02*
U.S. Cl. 266—49

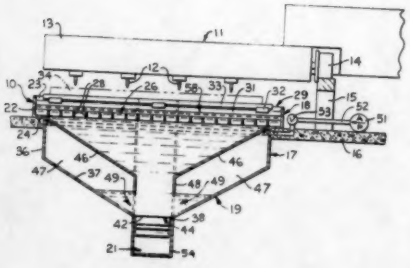
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 7,** and **10** are determined to be patentable as amended:

Claims **2–6, 8, 9, 11,** and **12,** dependent on amended claims, are determined to be patentable.

1. A waste collector adapted for supporting a workpiece beneath a flame cutting machine and to receive waste material therefrom comprising:

a tank having an open top and containing a *constant volume of* liquid normally maintained at a predetermined *static* upper level;



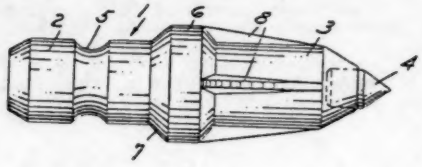
liquid level control means connected to said tank for normally maintaining said liquid at said *static* upper level and for selectively lowering and maintaining the *said constant volume of* liquid [level] at a predetermined lower level disposed vertically below said upper level; and

a horizontally disposed grating means attached to said tank to extend across the open top thereof and disposed vertically below said upper level and vertically above said lower level.

B1 3,476,438 (117th)
CUTTER BIT

Arnold B. Bower, Jr., St. Clair Shores, Mich., assignor to Hughes Tool Co., Houston, Tex.

Reexamination Request No. 90/000,207, May 28, 1982.
Reexamination Certificate for Patent No. 3,476,438, issued Nov. 4, 1969, Ser. No. 691,271, Dec. 18, 1967.
Filed May 28, 1982, Ser. No. 691,271
Int. Cl.³ E21C *35/18*
U.S. Cl. 299—86



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **2** is confirmed.

Claim **1** having been finally determined to be unpatentable, is cancelled.

[1. A cutter bit for a mining machine having a forward head portion at one axial end thereof and a rearward shank portion at the opposite axial end thereof, said head portion having a single hard cutting tip positioned at its forward central axial extremity, the shank portion being cylindrical and adapted for free rotatable attachment to a mining machine cutter block, a plurality of fins projecting radially from the peripheral surface of the head portion, each of said fins extending along a single axial plane from a position rearward of the cutting tip to a position forward of the shank, said fins being adapted to form non-cutting frictional contact with the surface being cut to enhance the free rotation of the bit in its block.]

2. The cutter bit of claim **1** in which the fins extend from a position rearward and spaced from the cutting tip so that the bit contains a conical portion free of fins between the forward end of the fin and rearward end of the tip.

B1 4,162,351 (118th)
METAL-HALOGEN CELL OPERATION WITH STORAGE OF HALOGEN VIA ORGANIC COMPLEXATION EXTERNAL TO THE ELECTROCHEMICAL CELL

Ronald A. Putt, Palatine, and Mark J. Montgomery, Lake Zurich, both of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Reexamination Request No. 90/000,037, Jul. 29, 1981.
Reexamination Certificate for Patent No. 4,162,351, issued Jul. 24, 1979, Ser. No. 841,391, Oct. 12, 1977.
Filed Jul. 29, 1981, Ser. No. 841,391
Int. Cl.³ H01M *8/08, 4/60*
U.S. Cl. 429—15

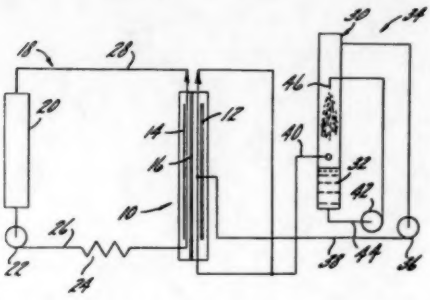
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **7,** having been finally determined to be unpatentable, are cancelled.

Claims **2–6** and **8–10** are determined to be patentable as amended:

New claims **11–13** are added and determined to be patentable.

9. A method of operating a battery system including at least one halogen positive *porous, flow through* electrode and [an electrolyte] *an aqueous liquid* containing halogen *and electrolyte in solution therein* which comprises providing a storage for halogen in a *non-aqueous* liquid phase external of the cell, circulating [electrolyte] *said aqueous liquid* between the halogen storage and the cell, and providing sufficient liquid-liquid contact in the storage between [the electrolyte] *said aqueous liquid* and the halogen *in said non-aqueous liquid* to maintain the desired concentration of halogen in the electro-



lyte [.] *during cell discharge by pumping a stream of one of said liquids into the other of said liquids to form droplets of said non-aqueous liquid, and allowing said droplets to traverse through said aqueous liquid and collect in a stationary non-aqueous phase in said storage means, and simultaneously withdrawing said aqueous liquid from said storage means, whereby said non-aqueous phase is retained in said storage means during cell discharge.*

REISSUES

AUGUST 16, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

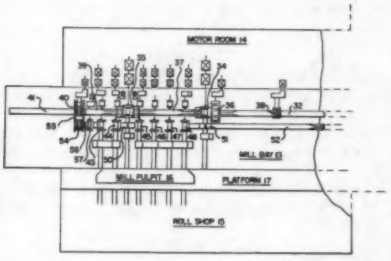
Re. 31,344
SEMI-CONTINUOUS HOT ROLLING OF METAL STRIP AND PLATES

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Original No. 4,296,623, dated Oct. 27, 1981, Ser. No. 74,876, Sep. 12, 1979. Application for reissue May 27, 1982, Ser. No. 382,595

Int. Cl.³ B21B *1/34;* B21C *47/00*

U.S. Cl. 72—227 **14 Claims**



19. An upcoiler and uncoiler for hot rolled strip comprising a cylindrical housing in scroll form split on a vertical plane into a larger and a smaller element, means pivoting each element of the housing about a fixed pivot at its lower edge, those lower edges being spaced vertically from each other so as to form the upper and lower edges of an entry into the housing at the bottom thereof, an entry guide leading into the entry, and parallel driven coil-supporting rolls at the same elevation straddling the vertical plane and forming a continuation of the lower end of the smaller element.

31. In a semi-continuous mill installation for hot rolling metal work pieces into strip or plate having a heating furnace facility in line with a roughing train including a reversing roughing stand, a finishing train positioned parallel to the roughing train but opposite thereto in direction of work travel and separate driving means for the roughing train and the finishing train, the improvement comprising a space-saving and heat-conserving arrangement in which the roughing train and the finishing train are adjacent each other, the run-out table and coiling means only for the finishing train extend in front of the heating furnace facility, the separate driving means for each train are positioned on the heating furnace side of the roughing train, and the pass line of the finishing train is disposed below the pass line of the roughing train sufficiently for the driving spindles only of the finishing train to cross therebelow.

36. In the method of rolling flat metal products including the step of reducing a hot slab to elongated stock by repeatedly passing it through the rolls of a roughing stand, coiling the hot stock as it is reduced in said roughing stand and then paying out the reduced hot stock and rolling it to final gauge in a finishing train, the improvement comprising rolling finished coils of weight less than the weight of the slab by paying out the coiled hot stock from the roughing stand into the finishing train and shearing the uncoiled hot stock immediately ahead of the finishing train after the desired weight of hot stock has entered the finishing train.

Re. 31,345
FLOOR COVERING SHEET FOR STABLES

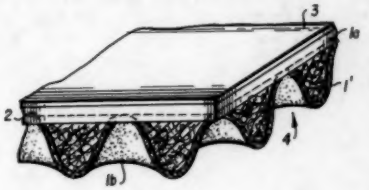
Udo Schwartzkopff, and Horst Fischer, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Original No. 4,129,097, dated Dec. 12, 1978, Ser. No. 773,932, Mar. 3, 1977. Application for reissue Jan. 18, 1982, Ser. No. 340,415

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 7607383[U]; Jan. 19, 1977, 7701427[U]

Int. Cl.³ A01K *1/015;* B22B *27/06*

U.S. Cl. 119—28 **7 Claims**



1. In structural combination with a stable floor for animals, a soft and resilient floor covering sheet comprising a highly porous, compressible sublayer in placement on said floor and a polymeric top layer which is impermeable to moisture, said compressible sublayer consisting essentially of a matting sheet composed of continuous, looped synthetic polymeric filaments intersecting one another and fused at their points of intersection, said filaments having a diameter of 0.4 to 2.5 mm, said matting having in its normal non-compressed state a porosity exceeding 90% with its porous structure being sufficiently open to prevent any accumulation of capillary moisture, and the upper face of said matting being at least partly embedded in said impermeable top layer.

Re. 31,346
ADVANCE MECHANISM FOR A MINE ROOF SUPPORT ASSEMBLY

Kunibert Becker, Werl; Willy Heyer, Bochum-Gerthe; Lubomir Plevak, Lunen, and Jürgen Dodt, Menden, all of Fed. Rep. of Germany, assignors to Gewerschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Original No. 4,195,953, dated Apr. 1, 1980, Ser. No. 974,462, Dec. 29, 1978. Application for reissue Jun. 5, 1981, Ser. No. 270,721

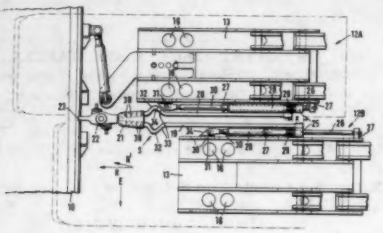
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758661; Dec. 29, 1977, 2758663

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—300 **23 Claims**

18. A roof support assembly for use in a longwall face of a mineral mining working, the roof support assembly being constituted by a plurality of roof support units positioned side-by-side, and means for advancing the roof support units towards the longwall face, each of the roof support units having at least one floor girder, the advance means being constituted by a plurality of external advance mechanisms, each advance mechanism comprising a pair of hydraulic advance rams and a pair of resilient, generally parallel guide rods, the guide rods being interconnected at one end by means of a head-piece which is attachable to a conveyor extending along the longwall face, the other end of each guide rod being attached to a respective slide piece which is slidably guided on a respective guide rail which is attached to a floor girder of a roof support unit, each hydraulic advance ram being

pivotally attached to a respective one of the slide pieces and being pivotally attached to the floor girder associated with that slide piece, wherein each advance mechanism is positioned between an



adjacent pair of roof support units, the guide rails of that advance mechanism being fastened to the adjacent floor girders of that pair of roof support units.

Re. 31,347

PROCEDURE FOR SEPARATING AND RECOVERING MARSH GAS

Veli E. Reijonen, Helsinki, Finland; Rudolf H. Martinell, Täby, and Rolf O. Hallberg, Tyresö, both of Sweden, assignors to VYR-Metoder, AB, Täby, Sweden

Original No. 4,187,148, dated Feb. 5, 1980, Ser. No. 845,623, Oct. 26, 1977. Continuation of Ser. No. 590,702, Jun. 26, 1975, abandoned. Application for reissue Feb. 4, 1982, Ser. No. 345,690

Int. Cl.³ C12D *3/10;* **C12P** *5/02*

U.S. Cl. 48—197 R **6 Claims**

1. A process for producing and recovering marsh gas generated from mud in a bog through bacterial activity comprising the steps of adding to the bog an adjusting chemical to adjust the pH value of the bog mud to be in the range from 5 to 8; adding to the bog a nutrient substance needed by methane bacteria, said substance being selected from the group consisting of phosphorus, potassium and nitrogen fertilizers; adding to the bog a trace element substance needed by methane bacteria, said substance being selected from the group consisting of iron, manganese, magnesium, calcium, nickel, cobalt, copper, zinc and molybdenum; conducting the mud from a depth having a hydrostatic pressure of several atmospheres into a separating space having subatmospheric pressure to separate the gas from the mud; conducting the gas to a place of storage or the use; and conducting the mud from the separating space back to the bog thus accomplishing a cyclic process where said adjusting chemical and said nutrient and trace element substances are added to the bog by means of adding them to the mud that is conducted back into the bog.

5. A continuous cyclical process for recovering marsh gas having a high content of methane from a bog containing methane bacteria, said process comprising withdrawing bog mud containing marsh gas from a predetermined location in a bog, directing the mud to a separating space while maintaining the separating space under subatmospheric pressure and therein separating the gas from the mud, conducting the gas from the separating space to a place of storage or use, and conducting the mud from the separating space and returning it to the bog at a location spaced apart from said predetermined location where it was withdrawn while maintaining the pH of the bog within the range of from 5 to 8.

Re. 31,348

HYPOCHLOROUS ACID PROCESS USING SWEEP REACTOR

John A. Wojtowicz, and Andrew J. Klanica, both of Cheshire, Conn., assignors to Olin Corporation, New Haven, Conn.

Original No. 4,147,761, dated Apr. 3, 1979, Ser. No. 884,950, Mar. 9, 1978. Application for reissue Aug. 28, 1981, Ser. No. 297,386

Int. Cl.³ C01B *11/04, 11/06*

U.S. Cl. 423—473 **15 Claims**

1. A process for preparing hypochlorous acid in a reactor which comprises rapidly passing gaseous chlorine in contact with the surface of an agitated solution of **[**an alkali metal**]** *sodium* hydroxide at a temperature below about 50° C.

a. whereby a gaseous phase containing unreacted chlorine, hypochlorous acid, and chlorine monoxide is formed,

b. whereby a reaction product of suspended particles of **[**alkali metal**]** *sodium* chloride in an aqueous solution of **[**alkali metal**]** *sodium* hypochlorite is formed, and

c. separating said gaseous phase as it forms.

Re. 31,349

LUBRICATED METALLIC CONTAINER STOCKS AND METHOD OF PREPARING THE SAME AND APPLYING ORGANIC COATING THERETO

John R. Smith, Richmond, and James A. Bray, Salineville, both of Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Original No. 3,826,675, dated Jul. 30, 1974, Ser. No. 233,748, Mar. 10, 1972. Application for reissue Nov. 28, 1980, Ser. No. 211,130

Int. Cl.³ B32B *15/18, 15/20*

U.S. Cl. 428—623 **21 Claims**

21. In a method of applying an organic coating to metallic container stock wherein a layer of an initially fluid organic varnish, lacquer or enamel for the container stock is applied to at least a portion of the surface area of the container stock and thereafter the layer of the initially fluid organic varnish, lacquer or enamel is hardened to form the said organic coating, the improvement which comprises improving the wettability of the said surface area of the container stock by the initially fluid organic varnish, lacquer or enamel by **[**employing thereon as the said lubricant a substantially uniform film**]** *applying to the surface area of the container stock only a substantially uniform film of a lubricant* consisting essentially of a citric acid ester of an alcohol containing 1–10 carbon atoms, the citric acid ester being present in an amount of about 0.05–1.0 gram for each 62,720 square inches of lubricated surface area of the container stock.

Re. 31,350

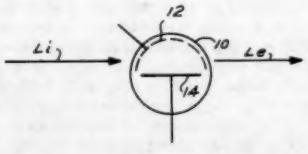
PHOTODETECTOR ARRANGEMENTS AND CIRCUITS

Morteza M. Chamran, Elmhurst, and Milan R. Dimovski, Countryside, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Original No. 4,223,215, dated Sep. 16, 1980, Ser. No. 907,687, May 19, 1978. Application for reissue Mar. 15, 1982, Ser. No. 358,163

Int. Cl.³ H01J *39/12*

U.S. Cl. 250—211 R **11 Claims**



1. An improved photodetector arrangement comprising

photodetector means having a cathode which is at least semi-transparent to a light beam, said cathode having the capability of emitting electrons when positioned in said light beam, said cathode being contoured and positioned relative to said light beam so that said light beam passes through said cathode at least twice while following a substantially single linear path *through and out of said photodetector means.*

Re. 31,351

FEEDBACK NONLINEAR EQUALIZATION OF MODULATED DATA SIGNALS

David D. Falconer, Nepean, Canada, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

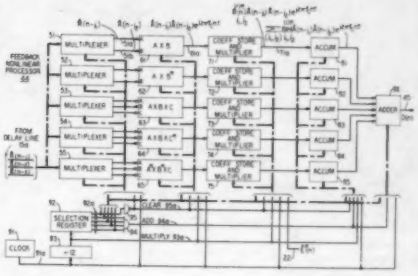
Original No. 4,181,888, dated Jan. 1, 1980, Ser. No. 931,025, Aug. 4, 1978. Application for reissue Dec. 24, 1981, Ser. No. 334,308

Int. Cl.³ H04B *1/16*

U.S. Cl. 375—15 **39 Claims**

32. Apparatus for processing a passband signal representing a succession of complex signal values, said apparatus comprising

means for forming a succession of weighted sums of products, individual multiplicands of at least ones of said products being derived from individual decisions as to respective ones of said signal values, at least ones of said individual multiplicands being the complex conjugates of the decisions from which they were derived and each of at least ones of said products being multiplied by a respective harmonic of the carrier frequency of said passband signal, and



means for forming at least ones of said decisions in response to said passband signal and ones of said weighted sums.

PLANT PATENTS

GRANTED AUGUST 16, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,085

ALMOND TREE ("WES-MAR")

Wesley Bradford, P.O. Box 941, Alamogordo, N. Mex. 88310

Filed Apr. 9, 1982, Ser. No. 366,992

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—30 1 Claim

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by substantially identical bloom-time and cross-pollenizing with the Carmel; and by regular bearing of small, well-sealed nuts having a small, plump, sweet kernel.

5,086

APPLE TREE

Francis W. Carnefix, Box 332, Fruitland, Id. 83619

Filed Apr. 26, 1982, Ser. No. 371,651

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—34 1 Claim

1. The new and distinct variety of Jonathan apple tree substantially as herein shown and described, similar to its parent Jonnee strain of Jonathan apple tree with respect to trunk, branches, leaves, flowers and fruit, but uniquely characterized as to novelty by the significantly earlier coloring and maturing of its fruit.

5,087

AFRICAN VIOLET NAMED DARK PRINCE

Arnold W. Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Apr. 9, 1981, Ser. No. 252,614

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct African Violet cultivar, substantially as herein shown and described, characterized by its profuse production of very double wine-red flowers of medium size having up to seven petaloids.

5,088

CHRYSANTHEMUM NAMED COPPER MINE

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan American Plant Company, Parrish, Fla.

Filed Mar. 19, 1982, Ser. No. 359,748

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—79 1 Claim

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by the unique golden bronze coloring of its very large blooms, its uniform eight-week response, its strong and upright growth habit, and its capability of being flowered at any time during the year.

PATENTS

GRANTED AUG. 16, 1983

ERRATA

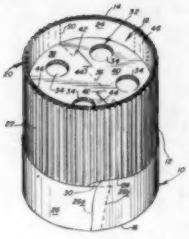
For CLASS	See PATENT NO.
271–010	4,398,709
419–018	4,398,952
523–173	4,399,064
260–112	4,399,121
208–011	4,399,314
377–026	4,399,354
377–018	4,399,355

PATENTS

GRANTED AUGUST 16, 1983

GENERAL AND MECHANICAL

4,398,305
FOLDABLE CAP CONSTRUCTION
Henry R. Kapel, 12655 Coit Rd., Cleveland, Ohio 44108
Filed Apr. 29, 1981, Ser. No. 258,570
Int. Cl.³ A42B *1/02, 1/04*
U.S. Cl. 2—195 **4 Claims**



1. A longitudinally elongated, disposable head covering, the head covering defined by a peripheral, cylindrical wall having opposed end sections, a crown member secured to the upper end section, and the lower end section being unobstructed to allow for reception therein of the head of a user; the improvement comprising, in combination:

said crown member being a generally circularly shaped cardboard disc scored along a diameter thereof so as to bisect the disc into two segments and to facilitate folding of said disc between a collapsed condition and a shape-sustaining, generally planar condition; the disc including tab members and cut-out members positioned along the scored diameter thereof, the tab members and cut-out members being correspondingly shaped and sized so that the tab member of one disc segment frictionally engages the cut-out member of the other disc segment when the crown member is in the shape-sustaining condition;

whereby the crown member can be folded upon itself when the head covering is collapsed for storage and shipment, and the crown member can be restored to a generally planar condition to frictionally maintain the cylindrical shape of the head covering when the head covering is worn.

4,398,306
CHIN STRAP SAFETY ATTACHMENT FOR PROTECTIVE HEADGEAR
Elwyn R. Gooding, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.
Filed May 28, 1981, Ser. No. 267,304
Int. Cl.³ A42B *7/00*
U.S. Cl. 2—421 **3 Claims**

1. A safety attachment for securing protective headgear to a wearer's head comprising:

a chin strap mountable to one side of the protective headgear, extending therefrom so as to engage the wearer's chin and terminate at a free end,

an anchor plate having an opening therein and mountable to the other side of the protective headgear in alignment with said free end of the chin strap,

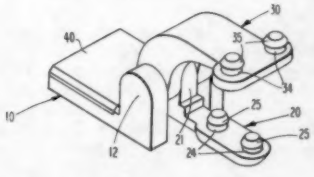
anchor insert means mounted on said chin strap at a position adjacent to and spaced from said free end of the chin strap, said insert means being insertable in said anchor plate opening,

engagement means on said anchor insert engageable with said anchor plate on opposite sides of said opening when tension is placed upon said chin strap and said anchor insert so as to prevent unintentional removal of the protective headgear, and

snap fastener means on said free end of the chin strap en-

gageable with said anchor plate so as to further secure the chin strap when tension is placed thereon and to maintain proper alignment of said anchor insert relative to said opening.

4,398,307
HINGE FOR TOILET SEAT
Milton Ginsburg, Bala Cynwyd, Pa., and C. Bruce Dawson, Winchester, Va., assignors to Ginsey Industries, Inc., Bellmawr, N.J.
Filed Jun. 7, 1982, Ser. No. 385,545
Int. Cl.³ A47K *13/12*
U.S. Cl. 4—236 **16 Claims**



1. A composite hinge for a toilet seat and lid adapted to be assembled by snap fitting together the elements of the hinge, said hinge comprising:

a. a bowl leaf;

b. a lid leaf;

c. a seat leaf;

d. said lid leaf having a forwardly extending portion and a pair of spaced-apart legs depending from said forwardly extending portion at the rearward end thereof, each of said legs of said lid leaf having a pair of integral pins extending laterally therefrom in opposing inward and outward directions, with the inwardly extending pins facing each other at spaced separation;

e. said seat leaf having a forwardly extending portion and an arm extending upwardly therefrom at the rearward end

thereof, said upwardly extending portion being provided with opposed recesses for receiving the inwardly extending pins of said legs of said lid leaf, said opposed recesses defining a neck therebetween, the portion of said upwardly extending arm rearward of said neck having a camming edge for spreading apart the inwardly extending pins of said lid-leaf legs;

f. said bowl leaf having a base portion and a pair of spaced-apart arms extending upwardly from the forward portion of said base portion, the surfaces of said arms which face inwardly toward each other including camming surfaces, said legs above said camming surfaces being provided with recesses for receiving the outwardly extending pins of said lid-leaf legs.

4,398,308

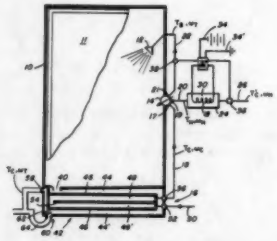
ENERGY CONSERVATION IN SHOWER BATHING

Charles A. Berg, RFD 1, Box 165, Buckfield, Me. 04220

Division of Ser. No. 147,372, May 7, 1980, Pat. No. 4,300,247. This application Sep. 4, 1981, Ser. No. 298,293

Int. Cl.³ A47K 3/22

U.S. Cl. 4—598 **2 Claims**



1. A process for minimizing energy consumption in a shower bath having a bathing enclosure, a mixing valve for mixing first and second water flows, and a drain, said process comprising the steps of:

A. preheating a first, incoming cold water, flow by heat exchange with hot drain water;

B. delivering said first, preheated cold water, flow to the mixing valve;

C. locally heating a second, feed water, flow to a temperature of at least about 170° F.; and

d. delivering the second, locally heated water, flow to the mixing valve, whereby to attain a selected bath water temperature, the flow ratio between the first, preheated water, flow and the second, locally heated water, flow delivered to the mixing valve is no less than 1.0.

4,398,309

ROLLER SUPPORTED SLIDING SHOWER CADDY

Shelden M. Simons, 14110 Lemoli Ave., Hawthorne, Calif. 90250

Filed Jan. 4, 1982, Ser. No. 336,829

Int. Cl.³ A47K 3/22

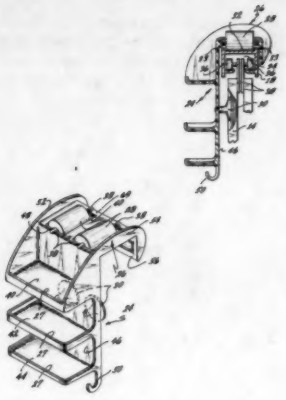
U.S. Cl. 4—605 **15 Claims**

1. A fixture useful for supporting toilet articles or the like for installation in a shower enclosure of the type including a sliding partition and an upper extrusion for supporting the partition, said fixture comprising:

an upper portion dimensioned to straddle said upper extrusion for sliding movement therealong;

one or more article trays supported by said upper portion; and,

means for securing said fixture to said slidable partition whereby said fixture is suspended form said upper extrusion and is slidable therealong responsive to movement of said partition.



4,398,310

WASHSTAND DEVICE

Rolf Lienhard, Hinwil, Switzerland, assignor to Maschinenfabrik Ad. Schulthess & Co. A.G., Zurich, Switzerland

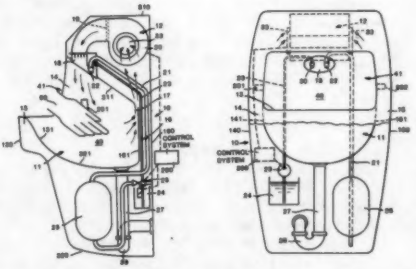
PCT No. PCT/CH80/00029, § 371 Date Nov. 26, 1980, § 102(e) Date Nov. 26, 1980, PCT Pub. No. WO80/01983, PCT Pub. Date Oct. 2, 1980

PCT Filed Feb. 27, 1980, Ser. No. 220,059

Claims priority, application Switzerland, Mar. 26, 1979, 2800/79

Int. Cl.³ E03C 1/05

U.S. Cl. 4—623 **5 Claims**



1. Handwashing apparatus comprising:

a housing having walls defining a chamber and having a front opening through which at least one hand can be inserted into the chamber;

a washbasin located in said housing and including discharge means for removing used water;

hot-air dryer means located in said housing for supplying hot-air into said chamber;

water supply means located in said housing above said washbasin for supplying water into said chamber;

soap dispensing means located in said housing above said washbasin for supplying soap into said chamber;

a discharge opening in at least one wall of said housing which defines said chamber for discharging hot air supplied to said chamber by said hot-air dryer means and for

supplying said discharged air to said hot-air dryer means; and

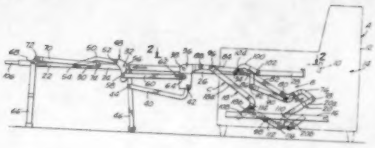
control means for automatically controlling operation of said water supply means, said soap dispensing means and said hot-air dryer means when said at least one hand is inserted through said front opening into said chamber.

4,398,311

FOLDING SOFA-BED MECHANISM

Melvin P. Spitz, Beverly Hills, Calif., assignor to Kinematic Industries, Inc., Whittier, Calif.

Filed May 18, 1981, Ser. No. 264,269
Int. Cl.³ A47C 17/04
U.S. Cl. 5—13 **26 Claims**



1. In a folding sofa-bed construction including a bed frame having a plurality of frame sections, one of which is an inner head section and another an adjacent body section, said sections being pivotally interconnected in end-to-end relation for selective unfolding movement to an extended coplanar bed-forming position and folding movement to a folded retracted sofa seat-forming position in which the body section is disposed generally horizontally along the base of the sofa frame and the head section extends generally upright in a space at the rear of the sofa seat behind a back center rail, mechanism for supporting and controlling the movements of said frame sections during movement of the bed frame to said extended and retracted positions, comprising:

(a) a stationary elongate substantially horizontal anchor frame plate;

(b) rear support linkage means pivotally connected between a rear pivot point on said anchor frame plate and a rear portion of said body section, said rear linkage means including an anchor link having a pivotal linkage suspension point of connection at its outer end and being pivoted at its inner end at said rear pivot point;

(c) front support linkage means pivotally connected between a front pivot point of said anchor frame plate and said body section forwardly of the connection of said rear support linkage means, said front linkage means including an anchor link having a pivotal connection at its outer end and being pivoted at its inner end at said front pivot point; and

(d) means interconnecting said front and rear anchor links operative during a portion of the swinging movement of said front anchor link in one direction, in response to unfolding and folding movements of the frame sections, to actuate the rear anchor link in a swinging direction opposite to that of the front anchor link.

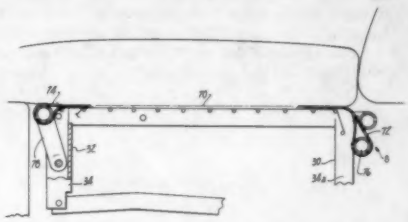
4,398,312

SOFA BED OVERDECK ASSEMBLY

David Duff, Ponca City, Okla., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jun. 2, 1981, Ser. No. 269,087
Int. Cl.³ A47C 17/04
U.S. Cl. 5—13 **2 Claims**

1. In a sofa bed assembly, a mechanism comprising a plurality of sections including in succession a head section, an intermediate section, and a foot section, said sections being foldable between collapsed sofa positions in which the sections are in substantially horizontal superposed relation and a horizontally extended bed position in which said sections extend in substantially horizontal alignment, a support frame for said sections disposed beneath said superposed sections in said sofa positions, linkage means pivotally supporting said head section on said support frame, connecting joint means pivotally supporting said foot section on said intermediate section and pivotally supporting said intermediate section on said head section, each said joint means including at each side of said mechanism a hinge bar pivotally connected at its ends to the connected sections, and an overdeck assembly comprising an elongated bar secured to the one of said joint means which supports said



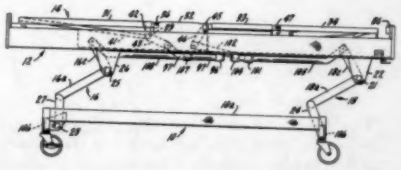
foot section on said intermediate section and extending transversely of said sections, a flexible deck member having a first end portion secured to said elongated bar and an opposite end portion secured to another joint means which supports said intermediate section on said head section, said deck member being disposed below said intermediate section in said bed position and having a predetermined width between said end portions so that when said sections are folded into the sofa position said deck member is stretched across said intermediate section and overlies said intermediate section.

4,398,313

MANUAL CONTROL SYSTEM FOR ADJUSTABLE HOSPITAL BED

Larry D. Mitchell, Manchester, Mo., assignor to B-W Health Products, Inc., Maryland Heights, Mo.

Filed Dec. 1, 1980, Ser. No. 211,543
Int. Cl.³ A47C 19/00
U.S. Cl. 5—66 **17 Claims**



1. An adjustable bed including a relatively fixed frame; a movable frame; a mattress support structure; head and foot lift mechanisms for raising and lowering the head and foot ends respectively of said movable frame; back and knee lift mechanisms for raising and lowering the back and knee sections respectively of said mattress support structure; power actuating means including transmission means engageable for directing torque to said lift mechanisms for actuation thereof, said transmission means including head, foot, back and knee lift screws respectively in driving relationship with said lift mechanisms, a gear train including a drive gear and head, foot, back and knee driven gears in meshing relationship with said drive gear, and head, foot, back and knee clutches selectively engageable for respectively establishing engagement of said driven gears with said lift screws, and motor means for supplying torque to said drive gear; and manual actuating means including control means for selectively engaging said transmission means with any number of said lift mechanisms for simul-

taneous actuation thereof, said control means including manually actuated head, foot, back and knee selecting means for selectively effecting engagement of any number of said clutches, and a hand crank engageable with said drive gear, said selecting means including a fixed plate defining head, foot, back and knee openings, head, foot, back and knee selector rods respectively operatively related to said clutches and extending into said openings, said rods being movable within said openings for effecting said clutch engagement, a plate slidable between first and second positions relative to said fixed plate, said slidable plate defining head, foot, back and knee surfaces respectively cooperable with said openings when said slidable plate is in its second position such that said rods are movable for effecting said clutch engagement and also movable into contact with said surfaces for maintaining said clutch engagement.

4,398,314

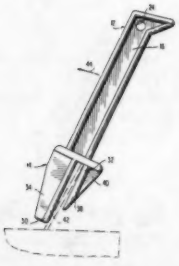
BOX TOP OPENER

Gregg A. Converse, and Maurice Converse, both of 1311 Briarhill Dr., Akron, Ohio 44313

Continuation of Ser. No. 189,882, Sep. 23, 1980, Pat. No. 4,371,021. This application Sep. 30, 1982, Ser. No. 429,399

Int. Cl.³ B67B *7/00*

U.S. Cl. 7—151 **3 Claims**



1. A box top opener comprising elongated handle means, plate means secured to and extending transversely to the length of said handle means at one end thereof, first and second flat, parallel, closely spaced apart jaws extending from said plate means away from said handle means for receiving a box top therebetween for separating that portion of a box top received therebetween from the sides of the box and bending said portion upwardly to open one corner of the box to provide access to the contents thereof said first jaw being comprised of a substantially rectilinear plate having a width and length sufficient to overlie a substantial portion of the upper surface of the box top and said second jaw being comprised of a triangular plate the base of which is equal to the width of the upper plate and the length of which is greater than half the length but considerably less than the full length of said first plate, the edges of said triangular second plate remote from said first plate being beveled to facilitate insertion of said second plate beneath a box top and reinforcing means secured to and extending perpendicularly to said plate means and said jaws for reinforcing said jaws against bending movement relative to said plate means.

4,398,315

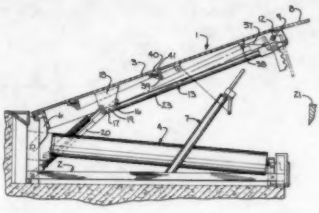
YIELDABLE AND RELEASABLE LIP LIFTING MECHANISM FOR A DOCKBOARD

Joseph R. Driear, Thiensville, and Jonathan W. Kovach, Milwaukee, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 333,251

Int. Cl.³ E01D *1/00*

U.S. Cl. 14—71.3 **10 Claims**



8. In a dockboard having a ramp pivoted at its rear edge to a supporting structure and having a lip hinged to the front edge of the ramp and movable between a downwardly hanging pendant position and an extended position, lip lifting means for pivoting the lip from the pendant position to the extended position and for holding the lip in the extended position, said lip lifting means comprising a first toggle section having one end operably connected at a first pivot to said lip, a second toggle section having one end operably connected to the ramp at a second pivot, a pivot pin interconnecting the opposite ends of the toggle sections together, said pin extending through a hole in said first toggle section and extending through a slot in said second toggle section, said slot extending diagonally across the axis of said second toggle section, resilient biasing means for biasing said pin to the end of the slot facing toward said lip whereby said pin is biased into an undercenter location with respect to a line passing through said first and second pivots and said toggle sections are in an under toggle position, and stop means for holding said toggle sections in said under toggle position, said toggle sections when in the under toggle position acting to support the lip in the extended position, an external force applied to the extended lip acting to move said pin within said slot against the force of said biasing means to an overcenter location whereby continued application of said extended force on said lip will pivot said toggle sections to an over toggle position and permit said lip to fall to a pendant position.

4,398,316

SPEED SELECTOR SWITCH

Ernest R. Scott, Mayfield Heights, and Raymond J. Strnad, Avon, both of Ohio, assignors to The Scott & Fetzer Company, Westlake, Ohio

Filed Jan. 13, 1982, Ser. No. 339,107

Int. Cl.³ A47L *9/28*

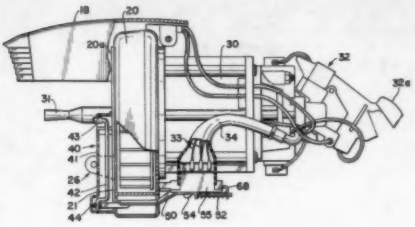
U.S. Cl. 15—332 **8 Claims**

4. In a vacuum cleaner having a housing providing an exterior face for supporting a removable work attachment operable in conjunction with an electric motor contained within the housing, an electrical switching mechanism for regulating energization of the motor comprising:

a multiposition slide switch mounted within the housing and spaced from its inner walls having fixed and movable contacts and the slide switch being electrically connected to the motor to control its state of energization; and

a biased linkage connected between the switch and the exterior face for supporting a work attachment, the linkage passing freely through a wall of the housing, the work attachment, when positioned against and supported by the

exterior face, engaging the linkage to move it from its normal biased position to another position, the slide



switch moving with the linkage to establish a state of energization of the motor.

4,398,317

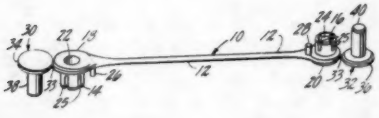
CHECK STRAP

Gary L. Schubring, New Baltimore, Mich., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 12,001, Feb. 14, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,455

Int. Cl.³ E05F *5/14, 7/06;* B60R *7/06*

U.S. Cl. 16—82 **2 Claims**



1. A strap for limiting travel between a glove box door and the glove box structure of a vehicle, said strap comprising a pair of cylindrical bosses each having a circular flange at one end thereof, each said flange connected to a respective opposite end of a resilient link, said link being flexible in all directions about its center line, each of said bosses having a circular bore formed therethrough to provide a relatively thin wall, each said circular bore having an inwardly tapered portion extending toward the end of said bore opposite said end at which said flange is disposed to provide a minimum dimension of said bore near said opposite bore end, a pair of cylindrical drive pins each comprising a cylindrical shank for insertion into a said bore and a circular head at one end thereof each connected to a respective circular flange of a said boss by a frangible portion of said strap, a plurality of slots formed in said thin wall and extending from said opposite bore end over substantially the length of said tapered portion of each said boss and a pair of elongated members one extending from said strap adjacent each of said bosses and substantially parallel thereto, whereby with one boss and its adjacent elongated member received in a respective pair of spaced openings in said door and the other said boss and its adjacent elongated member received in a respective pair of spaced openings in said glove box structure, said cylindrical drive pins separated from said strap at said frangible portions are assembled with each said pin shank inserted into a respective boss bore causing said boss bore to expand and retain said boss in its respective opening with said elongated member inhibiting rotation of said boss.

4,398,318

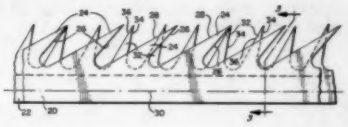
CARD CLOTHING FOR CARDING MACHINE ELEMENTS

Robert C. Ashworth, III, Greenville, S.C., assignor to Ashworth Bros., Inc., Fall River, Mass.

Filed Apr. 30, 1981, Ser. No. 259,365

Int. Cl.³ D01G *15/84*

U.S. Cl. 19—114 **5 Claims**



1. Metallic wire card clothing for rolls and like carding elements comprising:

a plurality of generally flat wire strips disposed side-by-side on a supporting element;

an upstanding portion on each said strip providing a row of flat teeth extending longitudinally of each said strip with each tooth having front and trailing edges converging from the base portion of the strip to define a tooth point;

said front edges of the teeth in each said row defining a common acute angle with the axis of the strip on which they are located; and

said common acute angle of said teeth front edges forming one row being greater than the common acute angle of said teeth front edges forming the adjacent row by a difference of more than 10 degrees.

4,398,319

GILL BOXES WITH ROTATING HEADS

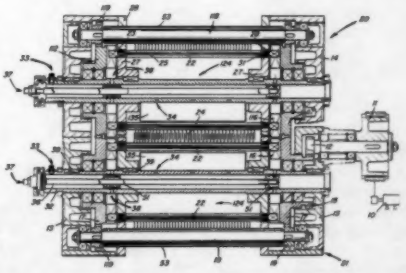
Ferdinando Viaggi, Imola, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Apr. 28, 1981, Ser. No. 258,444

Claims priority, application Italy, Jun. 19, 1980, 83399 A/80

Int. Cl.³ D01G *19/10*

U.S. Cl. 19—129 R **10 Claims**



1. An improved gill box with rotating heads, comprising a plurality of needles that act on an assemblage of slivers fed substantially continuously, and composed of a feeder group, a group controlling the fibers which consists of a pair of heads with combs having ends and a needle field superimposed one above the other and rotating in cooperation, and a drawing group, said gill box comprising

opposed rotating guide means to guide the ends of the combs,

fixed guide-cam means cooperating in an intermediate position between the needle field and said rotating guide means,

means to lubricate said rotating guide means,

means to feed and convey fluid under pressure into an outgoing zone of the sliver and inside each needle field,

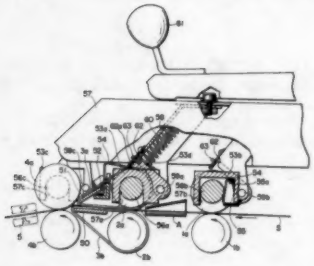
means to ensure a path of differentiated insertion of the needles into the sliver,
means for a perpendicular and non-interfering withdrawal of the needles from the sliver,
means for individual protrusion of the combs for better cleaning of the needles,
pulling means always in phase with said rotating guide means,
means which reduce angular play, and
drawing means positioned to reduce the outgoing travelling distance of the sliver.

4,398,320

METHOD AND APPARATUS FOR TRANSMITTING DRIVING POWER IN DRAFTING DEVICE OF SPINNING FRAME

Nobunori Kubota, Kyoto; Hisaaki Kato, Shiga, and Teruo Nakayama, Ohtsu, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Apr. 27, 1981, Ser. No. 257,510
Claims priority, application Japan, Apr. 30, 1980, 55-58905
Int. Cl.³ D01H *1/22*
U.S. Cl. 19—236 **12 Claims**



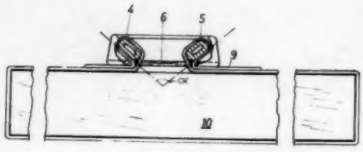
4. An apparatus for transmitting a driving power in a drafting device of a spinning frame, said drafting device comprising a pair of top and bottom back rollers rotated positively in close contact with each other along a yarn passage, a pair of top and bottom middle rollers provided with an apron and rotated positively in close contact with each other along the yarn passage and a pair of top and bottom front rollers rotated positively in close contact with each other along the yarn passage, in which supporting shafts for supporting the top back roller, top middle roller and top front roller, respectively, are gripped dismountably by side walls of bearings which have a substantially U-figured section, spring ends and springs having fixing pins as fulcrum, said springs being spread on the fixing pin mounted one end of each bearing, through reduction gears rotation is transmitted to drive the driving gear connected to the bottom front roller and is transmitted to drive the driving gear connected to the bottom back roller through separate reduction gears rotation is transmitted to drive the driving gear connected to the bottom middle roller, and the top back roller, top middle roller and top front roller are arranged to be rotated at the contact position with the bottom back roller, bottom middle roller and bottom front roller by the locking action of a fixing lever to be pressed by contact pressing force.

4,398,321

LASHING SLING FASTENING BUCKLE

Bengt S. Sunesson, Angered, Sweden, assignor to Lyft-och Surrningsredskap AB, Kungalv, Sweden

Filed Jun. 1, 1981, Ser. No. 268,682
Claims priority, application Sweden, Jun. 2, 1980, 8004099
Int. Cl.³ A44B *11/10*
U.S. Cl. 24—196 **6 Claims**



1. An improved fastening buckle for slings and similar lashing-down straps, comprising a buckle frame, said buckle frame including a bottom plate, two opposite marginal portions of said bottom plate being angularly bent to form channels, an aperture formed in said bottom plate, said aperture extending between said marginal portions, the improvement comprising
two bars, end sections on said bars, said end sections displaceable in said channels independently of one another to their respective end position adjacent the edges of said aperture, through which aperture are intended to be passed the ends of said sling to be clamped in position by said bars, said bars being rotatable about the respective axes thereof between sling locking and unlocking positions in response to pulling forces exerted on said sling,
a side on each one of said bars facing said frame bottom plate,
a first part of said bar side having a round configuration, and a second part of said bar side, adjoining said first part, having an essentially flat configuration, said flat part being at an angle to said frame bottom plate in the sling locking position, said essentially flat sides of said two bars defining planes, said planes forming an angle α relative to one another in said sling locking position, the apex of said angle pointing into said aperture, and
stop faces on said end sections of said bars, said faces arranged to limit turning movements effected by said bars upon application of a pulling force on either end part of said sling passed about said bars.

4,398,322

HITCH PIN ASSEMBLY

Warren E. Ewen, R.R. 1, Jeffers, Minn. 56145

Filed Mar. 28, 1981, Ser. No. 239,528
Int. Cl.³ A44B *17/00, 19/00*
U.S. Cl. 24—201 LP **10 Claims**

1. A hitch pin assembly for coupling a tongue of a towed

vehicle with a hitch of a towing vehicle, wherein the tongue and hitch have vertical holes therethrough which are vertically aligned when the tongue and hitch are coupled, the hitch pin assembly comprising:

a coupling pin having a circular cross-section which is smaller in diameter than the vertically aligned holes for insertion downwardly through the vertically aligned holes and has a length such that an upper end of the pin is positioned above the holes and a lower end of the pin extends below the holes;

handle means attached to the upper end of the coupling pin and having a dimension which is greater than an uppermost of the holes to limit downward movement of the coupling pin in the holes;

collar means for mounting on the lower end of the coupling pin after the coupling pin is inserted downwardly through the vertically aligned holes, the collar means having a dimension which is greater than a lowermost of the holes to limit upward movement of the coupling pin in the holes;

a plurality of circumferentially spaced locking pins on an inner surface of the collar means;

a plurality of circumferentially spaced channels in the lower end of the coupling pin, each channel having an axial portion, a circumferential portion communicating with the axial portion, and a first locking seat portion communicating with the circumferential portion; and

bias spring means carried in the collar means for applying an axial bias force to maintain the pins in the respective locking seat portions.

4,398,323

LOCKING DEVICE

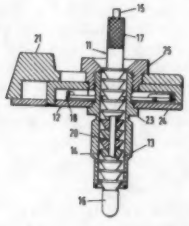
Michael A. Beard, Birmingham, England, assignor to DCA Design Consultants Limited, Warwick, England

Filed Nov. 24, 1980, Ser. No. 209,463

Claims priority, application United Kingdom, Dec. 17, 1979, 7943353

Int. Cl.³ A44B *17/00*

U.S. Cl. 24—211 L **10 Claims**



1. A locking device for releasably securing members under tension, comprising an elongate locking pin with a series of axially spaced transverse detent surfaces disposed along the pin, an anchoring base provided with a bore for through passage of the said locking pin, said base extending in a plane transverse to the axis of said bore, a slide mounted on said base and slidable in a transverse direction relative to said axis, locking spring arm means provided on the slide and movable by sliding thereof between a locking position and an unlocking position, the locking spring arm means when in the said locking position engaging a selected one of the said detent surfaces of the locking pin when said pin is inserted in the said bore thereby to lock the said pin against withdrawal from the bore, the locking spring arm means when in the unlocking position being disengaged from the said detent surfaces, and abutment means on said base and engaging said locking spring arm means for moving the latter between a pin-engaging position and disengaged position on movement of the slide and locking spring means between said locking and unlocking positions respectively, said abutment means providing a reaction biasing the spring arm means and slide towards the locking position.

4,398,324

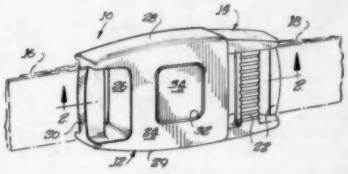
CENTER RELEASE BUCKLE

John A. Bakker, Bartlett, Ill., and Edward C. French, Fullerton, Calif., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 16, 1981, Ser. No. 244,429

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—230 R **11 Claims**



1. A buckle adapted to releasably secure extremities of a web-like material and comprising a receptacle body having a pair of oppositely facing side walls, an end wall and an end opening opposite said end wall, said side walls, end wall and end opening collectively defining a hollow interior, an insert body including a tongue portion adapted to slidably interfit through said end opening and within said hollow interior, said receptacle body further including a top wall having an aperture therein and a resiliently deflectable member disposed opposite and facing said top wall and extending between said end wall and said end opening, said resiliently deflectable member extending into said hollow interior and said resiliently deflectable member including a ramp surface converging inwardly of said hollow interior from a point adjacent said end opening of the receptacle body and upwardly towards the top wall to a point generally facing an intermediate point in said aperture defined in said top wall, said resiliently deflectable member integrally molded as a portion of said receptacle body and said insert body tongue portion comprising an integrally molded plastic part, said insert body tongue portion further including a raised portion for inter-engagement with said aperture in said top wall, said resiliently deflectable member initially deflecting in response to slidable insertion of said tongue portion into said hollow interior and thereafter resiliently urging said raised portion into at least partial telescopic association and inter-engagement with said aperture in said top wall for discouraging disengagement of said receptacle body from said insert body, said receptacle body and said insert body further being respectively provided with means for receiving said extremities of said web-like material.

4,398,325

PROCESS FOR PRODUCING ULTRASONIC TRANSDUCERS HAVING COMPLEX SHAPES

Bernard Piaget, Venon, and Jean-Francois Piquard, Vizille, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 10, 1981, Ser. No. 272,095

Claims priority, application France, Jun. 25, 1980, 80 14101

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **10 Claims**

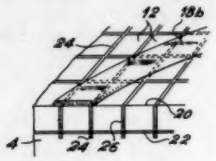
1. A process for producing complex ultrasonic transducers comprising the steps of:

glueing by means of a conductive glue a pizoelectric ceramic block to a conductive support which conductive support is connected to a reference potential;

cutting at least two rows of channels into said ceramic block each row of channels being cut along lines which are parallel to one another such that the channels of each row

intersect the channels of at least another row to produce elementary transducers and whereby the entire thickness of the ceramic block is cut through in order to mechanically insulate each produced elementary transducer;

selecting from among the produced elementary transducers



obtained by cutting in order to obtain a desired complex transducer shape;

electrically interconnecting the selected elements by one of their faces by means of a conductive deposit; and

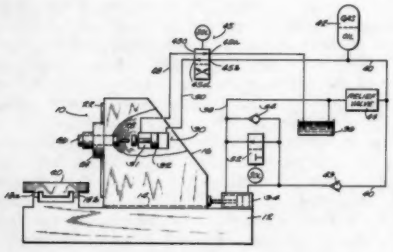
raising the other face of said elements to a reference potential.

4,398,326

COLLET UNCLAMPING MECHANISM

John R. Joerger, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Jul. 1, 1981, Ser. No. 279,328
Int. Cl.³ B23Q *3/00*
U.S. Cl. 29—26 A **5 Claims**



1. In combination with a numerically controlled machine tool having a bed, a member movable on said bed between a forward and a home position, a rotary driven cutting-tool carrying spindle rotatably carried in said member and a collet unclamping cylinder associated with said spindle for releasing a toolholder engaged in said spindle when said unclamping cylinder is pressurized with hydraulic fluid, an improved apparatus for pressurizing said unclamping cylinder with hydraulic fluid comprising:

a source of hydraulic fluid;

an accumulator containing a volume of inert gas and hydraulic fluid;

pump means fastened to said machine tool between said bed and said movable member for pumping hydraulic fluid from said source of hydraulic fluid into said accumulator to increase the volume of hydraulic fluid in said accumulator, thereby increasing the pressure of said fluid, as said movable member moves on said bed from its forward to its home position;

means for preventing hydraulic fluid pumped into said accumulator by said piston pump from flowing back into said piston pump from said accumulator; and

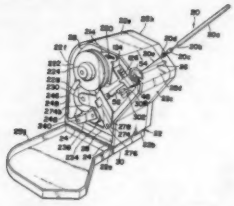
means responsive to numerical control commands for coupling said collet unclamping cylinder between said accumulator and said source of hydraulic fluid to conduct hydraulic fluid from said accumulator into said unclamping cylinder to pressurize said unclamping cylinder at predetermined intervals and to conduct the hydraulic fluid from said unclamping cylinder into said source of hydraulic fluid during intervals other than said predetermined intervals, respectively.

4,398,327

PLEDGET LOADING APPARATUS

Sakuzo Yamazaki, Kiryu, Japan, assignor to Sankin Engineering Company Limited, Kiryu, Japan

Filed Dec. 24, 1980, Ser. No. 220,250
Claims priority, application Japan, Dec. 29, 1979, 54-172347
Int. Cl.³ B23P *21/00*
U.S. Cl. 29—33 R **9 Claims**



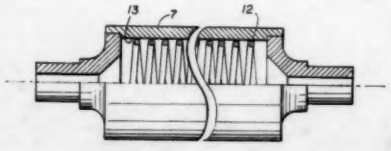
1. An apparatus for applying a cut segment of a flocculent material to an elongated needle instrument having a needle, comprising, in combination, an instrument receiver unit for receiving therein at least an axial portion of said needle instrument in such a manner that the needle of the instrument axially projects out of the receiver unit, said instrument receiver unit having an axial bore extending and laterally open throughout the length of the unit, thrust-out means operative to thrust the needle instrument laterally out of the axial bore in said instrument receiver unit into a predetermined first position laterally adjacent the receiver unit, transfer means operative to convey the needle instrument from said first position to a predetermined second position remote from the first position, supply means for storing a continuous length of flocculent material thereon and feeding a leading end portion of the continuous length of flocculent material to a predetermined delivery area into which the needle of said instrument is to axially extend when the instrument is received in said instrument receiver unit, and cutting means operative to cut said leading end portion into a segment in said delivery area.

4,398,328

ROLLS FOR SINGLE FACER

Hiroyuki Takenaka; Keiichi Katayama; Kouichi Tokiyasu, all of Hiroshima; Tadashi Hirakawa, and Hiroaki Sasashige, both of Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1981, Ser. No. 277,155
Claims priority, application Japan, Jun. 27, 1980, 55-87454
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—126 **7 Claims**



1. A roll for a single facer comprising:

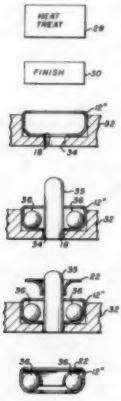
(a) a hollow cylinder having an interior wall;
(b) a resilient attenuating member disposed within said hollow cylinder and engaging said interior wall along substantially the full length of said interior wall;
(c) said member being urged by its resilience against said interior wall to reduce the vibration of the roll and the noise level of the single facer, whereby the wall of said cylinder may be made of reduced thickness while still keeping the noise at an acceptable level.

4,398,329

ROLLER SKATE BEARING

John A. Hitchner, New Hartford, and Henry A. Klipp, Berlin, both of Conn., assignors to Virginia Industries, Inc., Rocky Hill, Conn.

Filed Jul. 13, 1981, Ser. No. 282,447
Int. Cl.³ B21H *1/12*
U.S. Cl. 29—148.4 R **8 Claims**



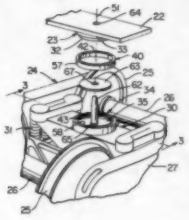
1. A method of manufacturing a ball bearing comprising the steps of:
forming a round cup-shaped member having a flat side wall portion and a base portion from metal stock, the base portion being partly transversely oriented with respect to said flat side wall portion;
scoring the inner surface of the formed cup-shaped member adjacent the upper periphery thereof to define a groove therein;
bending the peripheral portion of the cup-shaped member inwardly along the groove to form a radially inwardly extending flange, said flange defining a circular opening;
forming an opening in the base of the cup-shaped member, said opening being coaxial with said flange-defined opening, the axis of said opening being parallel to the straight portion of the side wall of said cup-shaped member, said cup-shaped member with coaxial openings comprising an outer race defining member;
producing an inner race defining member having a flat circular body of a diameter slightly greater than the diameter of the flange defined opening in the outer race defining member, said inner race defining member further having a tubular projection extending from the central region of said flat body, said tubular projection being open at the end disposed away from said flat body and being coaxial with said flat body;
heat treating the inner and outer race defining members;
finishing the surfaces of the inner and outer race defining members supporting the outer race defining member;
temporarily inserting a post within the outer race defining member, said post being coaxial with the outer race defining member;
positioning a discreet number of balls within the outer race defining member about the post;
inserting the tubular projection of the inner race defining member into said outer race defining member whereby said tubular projection contacts the balls and prevents travel thereof in the radially inward direction; and
exerting pressure upon said inner race defining member to cause said inner race defining member flat body to snap through said flange defined opening of said outer race defining member.

4,398,330

CENTER PLATE STRUCTURE FOR RAILWAY VEHICLE

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed May 6, 1981, Ser. No. 260,880
Int. Cl.³ B21D *53/10*; B61F *5/18*; F16C *17/04*
U.S. Cl. 29—149.5 C **6 Claims**



1. In a method of resisting wear between a body center plate provided on a body bolster of a railway vehicle body and a bolster bowl provided on a truck bolster of a truck of said railway vehicle, said body center plate having a supported planar bottom surface adjoined by a cylindrical outside surface and said bolster bowl having a planar supporting surface adjoined by an upstanding peripheral flange which has a cylindrical inside surface which is adapted to receive said outside surface therewithin, said method comprising the step of disposing a wear resistant tubular liner against said cylindrical inside surface so that said liner is sandwiched between said cylindrical surfaces with said body center plate disposed within said bolster bowl, said tubular liner being comprised of an ultra high molecular weight polymeric material and having a top surface, the improvement in said method comprising the step of fixing a continuous metal ring to said flange against a top portion of said inside surface before said step of disposing said liner, said ring serving to engage said top surface of said tubular liner and prevent vertical cold flow of the polymeric material comprising same from between said cylindrical surfaces.

4,398,331

METHOD OF CONNECTING PIPE PIECES VIA UNIVERSAL JOINT

Fumiya Inao, Tamano, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 238,047
Claims priority, application Japan, Apr. 24, 1980, 55-53517
Int. Cl.³ B23P *15/00*; F17D *1/08*
U.S. Cl. 29—157 R **1 Claim**

1. A method of connecting a first pipe and a second pipe which are within respective first and second adjacent cylindrical members coupled to each other through a universal joint in such a manner as to be able to swing relative to each other, said universal joint including a first pair of opposed yokes attached to one end of said first cylindrical member, a second pair of opposed yokes attached to an end of said second cylindrical member, and a cross pin pivotally mounted in said first and

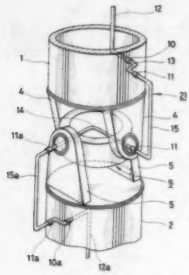
second pairs of yokes, said cross pin having a first hub, a second hub, a third hub, and a fourth hub; said method comprising:

extending said first pipe through a side wall of said first cylindrical member in parallel with said first hub,

extending said second pipe through a side wall of said second cylindrical member in parallel with said second hub,

extending a relay pipe through said first hub to said second hub, said relay pipe having a first end and a second end which project out of its respective hub,

connecting a first substantially S-shaped rocker pipe through a first swivel joint to an end of said first pipe which extends through said side wall of said first cylindrical member,



connecting a first substantially U-shaped connecting pipe to said first rocker pipe through a first ball joint and to said first end of said relay pipe through a second ball joint,

connecting a second substantially S-shaped rocker pipe through a second swivel joint to an end of said second pipe which extends through said side wall of said second cylindrical member, and

connecting a second substantially U-shaped connecting pipe to said second rocker pipe through a third ball joint and to said second end of said relay pipe through a fourth ball joint.

4,398,332

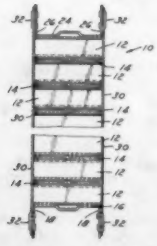
METHOD OF ASSEMBLING STACKABLE COMPONENTS

Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1980, Ser. No. 219,026

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 R **2 Claims**



1. A method of assembling a radiator structure which comprises the steps of:

stacking a first U-shaped channel member in a stacking fixture with the legs of said first U-shaped channel member being in an inverted position and forming a pair of strap securing areas on opposite sides of said first U-shaped channel member;

stacking a plurality of radiator forming structures upon said first U-shaped channel member;

stacking a last U-shaped channel member upon said plurality of radiator forming structures stacked on said first U-shaped channel member, the legs of said last U-shaped channel member being in an upstanding position and forming a pair of strap securing areas on opposite sides of said last U-shaped channel member;

applying pressure to form said first and said last U-shaped channel members and said radiator forming structure stacked therebetween into an assembly; and

while said assembly forming pressure is still being applied, stapling an assembly holding strap on each side of said assembly, each of said assembly holding straps being stapled to and extending between said strap securing areas of said first and said last U-shaped channel members.

4,398,333

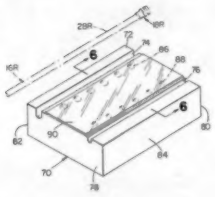
MANIPULATING TOOL

Philip D. Iantosca, Spokane, Wash., assignor to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Oct. 6, 1981, Ser. No. 309,033

Int. Cl.³ B23P *19/02, 19/00;* **B23Q** *7/10;* **B65D** *77/30*

U.S. Cl. 29—235 **12 Claims**



1. A storage and manipulating tool for replacement plunger heads (syringe tips) of the type which include a cylindrical body portion with a socket therein for receiving an attachment end of a cooperating plunger shaft and an annular flange portion of greater diameter than said body portion for sealing engagement with the precision bore of a cylinder of a metering device or the like,

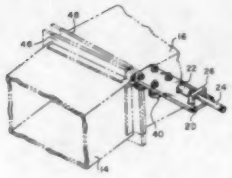
said manipulating tool having structure defining a plurality of storage cavities, each said storage cavity having a replacement plunger head disposed therein with the socket of the replacement plunger head adjacent to and facing the open end of its cavity, and elongated passage defining structure integral with said storage cavity defining structure, said elongated passage having a cross-sectional dimension that is uniform along its length and less than said annular flange portion of a replacement plunger head stored in a cavity and greater than said body portion of said stored replacement plunger head such that axial movement of a plunger shaft with an attached plunger head disposed in said elongated passage is effective to remove the attached plunger head from said plunger shaft and insertion of the exposed attachment end of the plunger shaft into a storage cavity is effective to attach a replacement plunger head to said plunger shaft for removal from said storage cavity without handling of the flange portion of the replacement plunger head attached to said plunger shaft.

4,398,334

DUCT WORK CLIP INSTALLER AND CRIMPER

Edward W. Kovalevich, 3813 High St., Camden, N.J. 08110

Filed Aug. 31, 1981, Ser. No. 297,690
Int. Cl.³ B23P 11/00
U.S. Cl. 29—243.5 9 Claims



1. A hand tool for installing clips to abutting edges of ducts and for crimping the clips to secure the ducts together comprising:

a rigid flat planar and elongated base plate having a front surface and a back surface;

handle means mounted on said back surface adjacent one end of said base plate;

a raised pusher means mounted on the front surface adjacent said one end of said base plate;

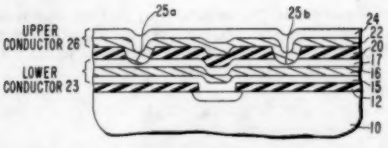
a pair of opposed rollers rotatably mounted on the front surface adjacent the other end of said base plate, said rollers being rotatable about axes perpendicular to said base plate and being spaced from each other on either side of a substantial centerline of said front surface so as to leave a gap between the other peripheries of said rollers which gap overlies said centerline and in alignment with said pusher means.

4,398,335

MULTILAYER METAL SILICIDE INTERCONNECTIONS FOR INTEGRATED CIRCUITS

William I. Lehrer, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Dec. 9, 1980, Ser. No. 214,615
Int. Cl.³ H01L 21/88
U.S. Cl. 29—577 C 15 Claims



1. A method of fabricating an electrical connection between two conducting layers in an integrated circuit structure comprising:

forming a first conducting layer of a metal silicide on the integrated circuit structure;

depositing a layer of silicon on the first conducting layer;

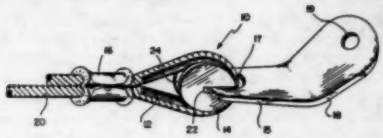
depositing a layer of a metal which reacts with silicon on selected regions of the layer of silicon to thereby form regions of metal silicide at the selected regions.

4,398,336

METHOD OF INHIBITING KINKING AND TWISTING OF A CABLE RELATIVE TO AN ANCHOR

Donald R. Beuch, 138 S. 211 East, Draper, Utah 84020

Division of Ser. No. 7,455, Jan. 29, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 225,928
Int. Cl.³ B23P 19/04
U.S. Cl. 29—433 8 Claims



1. A method for inhibiting kinking and twisting of a cable relative to an anchor secured to a cable thimble eye on the cable comprising:

forming an insert for the cable thimble eye, the insert having a cylindrical body with an external diameter incrementally greater than the internal dimensions of the cable thimble eye and a circumferential, thimble-receiving groove in the body, the insert including a radial, anchor-engaging, rectangular slot extending the length of the body;

obtaining a flat anchor having a thickness corresponding to the slot in the insert, the anchor having an aperture in the end thereof to receive the thimble and cable therethrough;

snugly inserting the end of the anchor into the slot in the thimble insert with the aperture in the anchor positioned at the circumferential groove in the insert;

inserting the thimble through the aperture and around the circumferential groove in the insert;

passing an end of the cable through the aperture and around the thimble onto a portion of the cable;

and

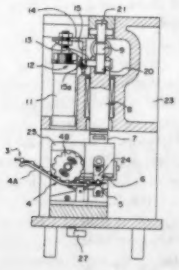
securing the cable end to the cable thereby inhibiting kinking and twisting of the cable relative to the anchor.

4,398,337

CONTINUAL CRIMPER

Yuji Yamaguti, and Hideo Miyata, both of Neyagawa, Japan, assignors to Nichifu Terminal Industries Co., Ltd., Osaka, Japan

Filed Oct. 27, 1981, Ser. No. 315,655
Claims priority, application Japan, Oct. 28, 1980, 55-155654; Feb. 13, 1981, 56-19910
Int. Cl.³ H01R 43/04
U.S. Cl. 29—564.6 7 Claims



1. A continual crimper equipped with: an apparatus (4) for transferring a belting assembly (3) of crimping electric connection pieces, made of a plurality of the crimping electric connec-

tion pieces (1) in a group juxtaposedly disposed at regular spacing intervals in parallel posture with their electric-wire-tip-end-insertion opening uniformly facing to one side, integrally united together with interconnecting planar members (2) thus to make up such a belting, the transfer being intermittent inching at a constant pitch corresponding to the said regular spacing interval so as to consecutively advance the crimping electric connection pieces (1) along the direction of the juxtapostion of the group; a movable die for crimping—by reciprocating movement thereof during the halting period of said intermittent apparatus (4)—the crimping electric connection piece (1) each as supplied unitwise by the transfer by means of the apparatus (4); and a driving element adapted to move intermittently; the continual crimper being characterized in that a driving mechanism is provided, in between the said driving element and the said movable die (6) for forcibly reciprocatingly moving the movable die (6) in accordance with the intermittent movement of the said driving element; and further that an interconnecting mechanism (10) is provided as adapted to cause the transferring apparatus (4) to move stepwise by a constant amount every time in accordance with forced restoring movement of the said movable die (6) which movement is driven by the movement of the movable die (6).

4,398,338

FABRICATION OF HIGH SPEED, NONVOLATILE, ELECTRICALLY ERASABLE MEMORY CELL AND SYSTEM UTILIZING SELECTIVE MASKING, DEPOSITION AND ETCHING TECHNIQUES

Andrew C. Tickle, Los Altos, and Madhukar B. Vora, Los Gatos, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Dec. 24, 1980, Ser. No. 219,784
Int. Cl.³ H01L *21/20, 21/225*
U.S. Cl. 29—571 **6 Claims**

1. A process for fabricating an oxide isolated electrically erasable memory cell semiconductor structure in an epitaxial layer of first conductivity type overlying a buried layer of first conductivity type, the process comprising the sequential steps of:

(a) forming a first layer of insulating material of a thickness which permits tunneling of electrons therethrough over a first region of a substantially planar surface of the epitaxial layer;

(b) introducing dopant of second conductivity type into all of the planar surface except the first region thereof;

(c) forming a first region of polysilicon of first conductivity type on the first insulating layer and a second region of polysilicon of first conductivity type on a second region of the planar surface;

(d) forming insulating material over all exposed surfaces of both the first and the second regions of polysilicon as well as over exposed areas of the planar surface;

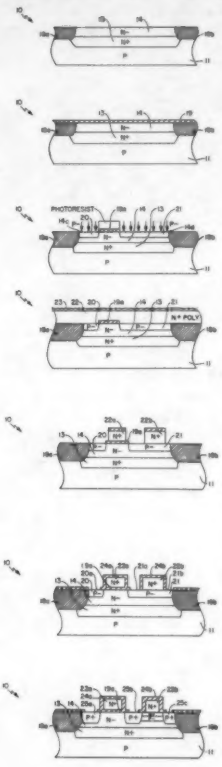
(e) patterning the insulating material to expose selected portions of the planar surface;

(f) introducing dopant of second conductivity type into the exposed selected portions of the planar surface;

(g) forming a first region of polysilicon of second conductivity type on the insulating material overlying the first region of polysilicon of first conductivity type and a second region of polysilicon of second conductivity type overlying the insulating material overlying the first region of polysilicon of first conductivity type;

(h) forming insulating material over all exposed surfaces of both the first and the second regions of polysilicon of second conductivity type; and

(i) forming a layer of conductive material over the structure formed according to steps a–h above such that the conductive material contacts the exposed selected portions of the planar surface.



4,398,339

FABRICATION METHOD FOR HIGH POWER MOS DEVICE

Richard A. Blanchard, Sunnyvale, and Benedict C. K. Choy, Campbell, both of Calif., assignors to Supertex, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 964,484, Nov. 29, 1978, abandoned, which is a division of Ser. No. 787,788, Apr. 15, 1977, Pat. No. 4,145,703. This application Sep. 9, 1981, Ser. No. 300,474
Int. Cl.³ H01L *21/467*
U.S. Cl. 29—571 **10 Claims**

1. In a method of fabricating a high power MOS semiconductor device comprising the steps of:

forming a substantially V-shaped groove in a semiconductor substrate through both a high conductivity region of one conductivity type and a region of opposite type conductivity that surrounds a substantial portion of said high conductivity region of one conductivity type,

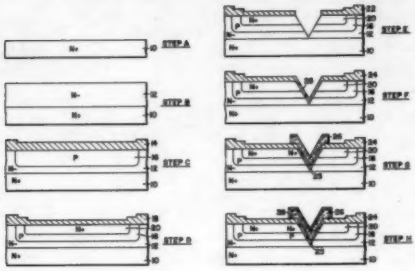
forming a first insulating layer in said V-shaped groove,

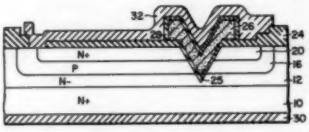
forming a doped electrically conductive polysilicon gate electrode layer on the surface of said first insulating layer,

forming a second insulating layer on said polysilicon gate electrode layer,

forming an opening in said second insulating layer to expose a surface portion of said polysilicon gate electrode layer,

depositing electrical contacts to make separate source and drain connections to regions of said semiconductor substrate and to make electrical contact to said polysilicon gate elec-





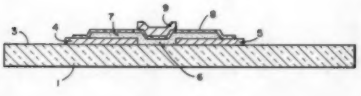
trode layer through said opening in said second insulating layer, one of said electrical contacts being located on said second insulating layer.

4,398,340

METHOD FOR MAKING THIN FILM FIELD EFFECT TRANSISTORS

Robert L. Brown, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1982, Ser. No. 371,639
Int. Cl.³ H01L *21/363*
U.S. Cl. 29—571 **3 Claims**



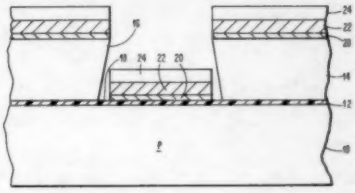
1. A method for making thin film field effect transistors comprising providing a substrate that has a substantially flat surface thereon, mounting a thin metal film on said surface of said substrate, photolithographic and acid etching first and second connections from said thin metal film to define a predetermined gap between said first and second connections, depositing a layer of semiconductor material in said gap and overlapping portions of said first and second connections, depositing an impervious insulation layer that overlaps all sides of said semiconductor layer over said semiconductor and a portion of said first and second connections, depositing a metal layer as a gate over said insulation layer and photolithographic and acid etching said metal gate to a size that is substantially identical in width to the gap between said first and second connections to provide a thin film field effect transistor that has high frequency characteristics due to the materials of the transistor and the precision by which the transistor can be made.

4,398,341

METHOD OF FABRICATING A HIGHLY CONDUCTIVE STRUCTURE

Henry J. Geipel, Jr., Essex Junction, and Larry A. Nesbit, Williston, both of Vt., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,436
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—578 **18 Claims**



1. A method of making a conductive structure comprising the steps of:

depositing a layer of metal on an inert insulator,

depositing a layer of atomic mixture of metal and silicon on said metal layer,

depositing a layer of silicon on said layer of metal and silicon, and

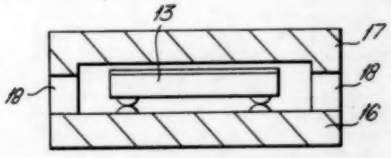
annealing said structure so as to convert said layer of atomic mixture of metal and silicon and substantially all of said metal layer and at least a portion of said silicon layer into metal silicide.

4,398,342

METHOD OF MAKING A HALL EFFECT DEVICE

Gillies D. Pitt, Saffron Walden; Peter D. Greene, Harlow; Edward J. Thrush, Stansted Mountfitchet, and David H. Whysall, Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,976
Claims priority, application United Kingdom, Apr. 14, 1981, 8111812
Int. Cl.³ H01L *43/04*
U.S. Cl. 29—580 **14 Claims**



1. A method of making an improved Hall-effect device assembly comprising:

providing a substrate with an epitaxial layer, having Hall electrodes thereon, and an intervening barrier layer between said substrate and said epitaxial layer, wherein said barrier layer has a composition different from said epitaxial layer and said substrate;

removing said substrate to form a Hall-effect device by dissolving said substrate with an etchant, wherein said etchant and said barrier layer are substantially non-reactive;

mounting said Hall-effect device in a space provided by disposing the substantially planar ends of two flux concentrator rods in substantially parallel facing relationship;

attaching leads in conducting relationship with said Hall-electrodes; and

encapsulating said Hall-effect device and said ends of said

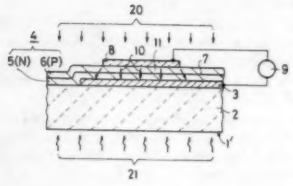
rods in a body of potting compound with said Hall-effect device disposed in said space substantially parallel to said rod ends and said leads extending externally of said body of potting compound.

4,398,343

METHOD OF MAKING SEMI-AMORPHOUS SEMICONDUCTOR DEVICE

Shunpei Yamazaki, 21-21 Kitakarasuyama 2-chome, Setagaya-Ku, Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,841
Claims priority, application Japan, May 26, 1980, 55-69772
Int. Cl.³ H01L *21/324, 21/326*
U.S. Cl. 29—585 **33 Claims**



1. A method for the manufacture of a semi-amorphous semiconductor device, comprising the step of:

preparing a substrate;

forming on the substrate a layer of non-single crystal semiconductor doped with a dangling bond neutralizer;

forming at least one conductive layer on the non-single crystal semiconductor; and

applying current to the non-single crystal semiconductor through the conductive layer and, at the same time, applying light to the non-single crystal semiconductor, thereby making semi-amorphous a region through which the current passes effectively.

11. A method for the manufacture of a semi-amorphous semiconductor device, comprising the steps of:

preparing a substrate;

forming on the substrate a layer of non-single crystal semiconductor doped with a dangling bond neutralizer;

forming at least one conductive layer on the non-single crystal semiconductor; and

applying current to the non-single crystal semiconductor through the conductive layer and, at the same time, applying heat to the non-single crystal semiconductor, thereby making semi-amorphous a region through which the current passes effectively.

18. A method for the manufacture of a semi-amorphous semiconductor device, comprising the steps of:

preparing a substrate;

forming on the substrate a layer of non-single crystal semiconductor doped with a dangling bond neutralizer;

forming at least one conductive layer on the non-single crystal semiconductor; and

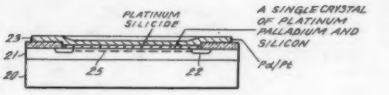
applying current to the non-single crystal semiconductor through the conductive layer and, at the same time, applying light and heat to the non-single crystal semiconductor, thereby making semi-amorphous a region through which the current passes effectively.

4,398,344

METHOD OF MANUFACTURE OF A SCHOTTKY USING PLATINUM ENCAPSULATED BETWEEN LAYERS OF PALLADIUM SINTERED INTO SILICON SURFACE

Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Mar. 8, 1982, Ser. No. 355,718
Int. Cl.³ H01L *29/48*
U.S. Cl. 29—590 **13 Claims**



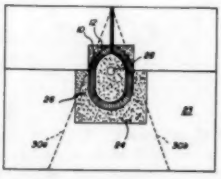
12. The process of manufacture of a semiconductor device comprising the steps of depositing a first layer of palladium atop a silicon wafer, depositing a layer of platinum atop said first palladium layer, depositing a second layer of palladium atop said platinum; and thereafter heating said silicon wafer and said platinum and palladium layers in order to diffuse platinum into said silicon wafer with said palladium acting as a fluxing agent whereby platinum is uniformly diffused into said silicon.

4,398,345

METHOD OF MAKING A MULTITRACK MAGNETIC HEAD EMPLOYING DOUBLE HELIX STRUCTURE

William W. French, Cardiff-by-the-Sea; James U. Lemke, Del Mar, and Richard J. McClure, San Diego, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 82,847, Oct. 9, 1979, Pat. No. 4,314,298.
This application Jun. 2, 1981, Ser. No. 269,911
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 **13 Claims**



1. A method for use in the making of a multitrack magnetic head, said method comprising the steps of:

(a) longitudinally cutting one side of a double helix core-and-coil structure formed of a substantially helical coil of electrically conductive wire wound on and about a helix of magnetic material, thereby to form a row of discrete coil-wound gapped cores,

(b) supporting said row of cores in a jig, and

(c) removing parts of said jig to form first and second rows of electrical contacts for the coils on said cores,

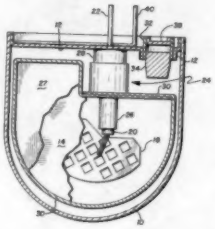
whereby electrical leads may be brought to said contacts to activate electrically said coils.

4,398,346

METHOD FOR LITHIUM ANODE AND ELECTROCHEMICAL CELL FABRICATION

Lloyd J. Underhill, Brooklyn Park, and William D. Helgeson, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 23, 1981, Ser. No. 314,210
Int. Cl.³ H01M *6/14, 4/04*
U.S. Cl. 29—623.5 **61 Claims**



21. A method of making an electrochemical cell wherein the anode includes an operative surface area and the cathode comprises a charge-transfer complex material, comprising the steps:

providing a lithium anode element having an operative surface to be associated with a cathode in a cell;

contacting at least the operative surface of the anode element with organic material;

heating the anode element and organic material to a temperature between at least about 260° F. and the melting temperature of the organic material;

providing a cathode including a charge-transfer complex material, and

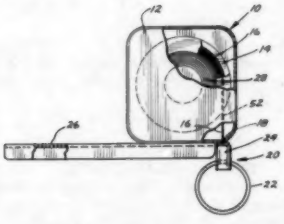
assembling the anode and cathode in electrochemically operative relationship.

4,398,347

TOOL FOR SEVERING THERMOPLASTIC ELECTRICAL CABLE SHEATH

Eugene P. Duffy, 1025 Lowry Ave. NE., Minneapolis, Minn. 55418

Filed Jun. 22, 1981, Ser. No. 275,930
Int. Cl.³ B26B *27/00*
U.S. Cl. 30—90.1 **10 Claims**



2. A tool for severing a heat reactive sheath forming the outer layer of an elongated object, said tool including:

an elongated flexible sheath-severing line having a braided outer surface which has a high coefficient of friction with respect to a heat reactive sheath to be severed, said line being adapted to be looped around the circumference of an elongated object covered by such a heat-reactive sheath at the place where the sheath is to be severed and to have standing parts extending away from the loop in opposite directions;

means for fixedly positioning the encircled portion of the elongated object; and

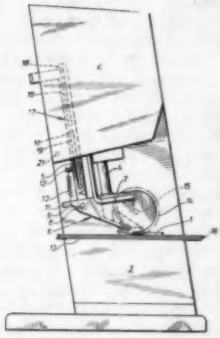
means for rapidly pulling the line in a first direction while maintaining the line loop tightly against the sheath.

4,398,348

DEVICE FOR MEASURING MOVEMENT OF MATERIAL USING A WHEEL ROLLING ON THE MATERIAL

Bengt A. Bergvall, and Kenneth O. E. Skogward, both of Huskvarna, Sweden, assignors to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Jun. 5, 1981, Ser. No. 270,799
Claims priority, application Sweden, Jun. 5, 1980, 8004226
Int. Cl.³ D05B *27/08*; B65H *25/20*
U.S. Cl. 33—133 **12 Claims**



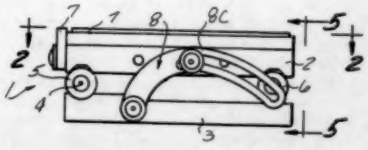
1. In a measuring device for measuring movements of cloth fed by cloth feeding means for producing signals for controlling the cloth feeding means of a sewing machine, the improvement wherein said measuring device comprises measuring means including a digital pattern on a carrier and sensing means positioned to sense movement of said pattern with respect to said sensing means, said measuring means being positioned with one of said pattern and sensing means mounted to be driven directly with movement of cloth fed by said cloth feeding means, and further comprising a decoder for decoding the output of said sensing means, up-down counter means coupled to said decoder for counting in a direction determined by the direction of relative motion between said pattern and sensing means, and control circuit means coupled to said counter for providing said signals.

4,398,349

PRECISION TOOLS AND PRECISION TOOL SETS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Donald H. Bailey, 1255 Vaughn Rd., Bloomfield Hills, Mich. 48013

Filed Feb. 22, 1980, Ser. No. 123,835
Int. Cl.³ B23Q *3/00*
U.S. Cl. 33—174 TA **29 Claims**



1. A precision tool set, comprising:

(a) a sine plate including a top plate hingedly connected to a

bottom plate, the top plate having a plurality of particularly dimensioned apertures formed therein according to a predetermined pattern;

(b) at least a pair of side rails removably secured to the top plate and each being movable between an upper, operative position and a lower, inoperative position, the side rails projecting above the upper surface of the top plate when in their operative position;

(c) a plurality of individual precision tools, each adapted to be removably mountable onto the top plate, each tool being interchangeable with any other tool, each tool having a plurality of particularly dimensioned apertures formed therein according to a predetermined pattern;

(d) a fastener for removably mounting a precision tool onto the top plate, and

(e) wherein when at least one precision tool is brought into abutment with the side rails, when in their operative position, (1) at least one aperture formed in the at least one tool will align and mate with at least one aperture formed in the top plate, the fastener being projectible through the mating apertures to enable removable mounting and (2) the at least one tool is precisely squared and paralleled.

22. A precision tool set comprising:

a plurality of separate precision tools, each adapted for individual use in precisely orienting and securing a workpiece thereon;

each said separate precision tool of said precision tool set being provided with a plurality of mating apertures;

said plurality of mating apertures of each said precision tool being particularly dimensioned and particularly arranged so as to define a mating hole pattern; and

said mating hole pattern defined by said mating apertures of each said precision tool of said precision tool set being adapted to permit selective and interchangeable interconnection of desired ones of said precision tools by means of fastening members received through relative cooperating mating apertures of desired ones of said precision tools;

one of said plurality of separate tools comprising a sine plate which includes a top plate hingedly connected to a bottom plate;

said plurality of mating apertures being provided in said top plate of said sine plate; and

said sine plate being provided with a locking strap;

said locking strap being formed so as to be substantially flat, with a substantially constant width and thinkness, and having a predetermined arcuate configuration;

said locking strap being affixed at a portion thereof to a side of said bottom plate of said sine plate, and at a portion thereof to a matching side of said sine plate immediately adjacent the top surface of the upper plate, so as to permit selective pivotal movement of said top plate relative to said bottom plate;

said predetermined arcuate configuration of said locking strap being such that the locking strap never rises above the planar upper surface of said top plate of said sine plate, regardless of the angular position of said top plate relative to said bottom plate.

27. A locking strap for a precision tool, comprising:

a substantially flat body having a substantially constant width and thickness and a predetermined arcuate configuration;

a first end portion of said locking strap being provided with a through hole, and an arcuate elongated slot extending from substantially a central portion of said strap to a portion of said strap adjacent a second end thereof; and

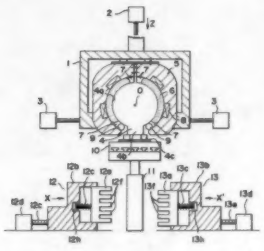
the radius of curvature of said locking strap varying substantially along the length thereof such that the arcuate portion between said first end and said central portion thereof has a substantially lesser radius of curvature than the radius of curvature of the arcuate portion of said locking strap between said central portion and said second end thereof.

4,398,350

CENTERING CONTROLLER FOR A TOOL ELECTRODE ON AN ELECTRICAL MACHINE TOOL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 29, 1981, Ser. No. 230,104
Int. Cl.³ G01B 7/31
U.S. Cl. 33—185 R **11 Claims**



1. A positioning device for orienting an axial member so as to be precisely in alignment with a predetermined axial direction, comprising:

a head member having an axis conciding with said predetermined directions;

a swivel support for securely holding said axial member, said support being adapted to be swivelably carried by said head member whereby to allow the axis of said axial member to be swung about a center of swing relative to said axis of the head member;

centering means comprising:

a plurality of casings which are displaceable, in a plane, along a plurality of axes, respectively, which are orthogonal to and equispaced radially about, said axis of the head member,

a plurality of pressure plates which have their respective pressure surfaces extending in parallel with said axis of the head member and which are received slidably and supported resiliently by elastic means, in said respective casings so as to maintain said respective parallelisms, and

means for advancing said casings respectively towards said axial member to allow said respective pressure plates to bear along said pressure surfaces against said axial member individually and then to conjointly come into pressure engagement therewith until after the pressures exerted by said respective elastic means via said respective plates on said axial member are equalized; and

support retainer means coupled to said head member and adapted to be actuated, after said equalization of the pressure by said elastic means, to fixedly secure said swivel support to said head member.

4,398,351

THREAD LEAD GAUGE

Merlyn J. Patrick, Houston, Tex., assignor to Raines Tool Company, Houston, Tex.

Filed Nov. 16, 1981, Ser. No. 321,453
Int. Cl.³ G01B 3/40
U.S. Cl. 33—199 R **12 Claims**

1. A thread lead gauge, which comprises:

a tubular barrel, said barrel including a first axially extending slot and a second axially extending slot spaced axially apart from and colinear with said first a axially extending slot;

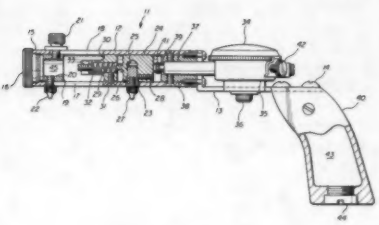
a first piston slidingly mounted in said barrel for movement within said barrel adjacent said first slot;

a first bearing pin connected to said first piston and projecting through said first slot perpendicular to the axis of said barrel;

means for fixing the axial position of said first piston, thereby to fix the axial position of said first bearing pin;

a second piston slidingly mounted within said barrel for movement adjacent said second slot;

a second bearing pin connected to said second piston and projecting through said second slot perpendicular to said barrel;



means for biasing said second piston axially away from said first piston;

a dial indicator having a stem mounted coaxial with said barrel, said stem including an axially movable plunger having a tip contacting said second piston;

and a hand grip connected to said barrel.

4,398,352

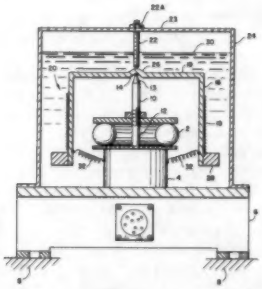
COMPENSATED MAGNETIC SENSOR FOR USE ON HIGHLY MAGNETIZED VEHICLES

Arthur E. Maine, Kirkland, Canada, assignor to Aviation Electric Ltd., Montreal, Canada

Filed Jul. 13, 1981, Ser. No. 282,974

Int. Cl.³ G01C *17/38*

U.S. Cl. 33—356 **11 Claims**



1. Apparatus for sensing the direction of the horizontal component of the earth's magnetic field to implement navigating a vehicle along a desired course, comprising:

a magnetic sensor strapped down to the vehicle structure so that the sensor axes and the vehicle axes coincide, whereby magnetism induced from the vehicle axes to the sensor axes when the vehicle pitches and rolls is essentially eliminated; and

a symmetrical coil member surrounding the strapped down sensor and pendulously-supported relative thereto, and energized fan generating a magnetic field which opposes the earth's vertical field to essentially eliminate the effect of said field on the sensor when the vehicle is displaced about at least one of its pitch and roll axes.

4,398,353

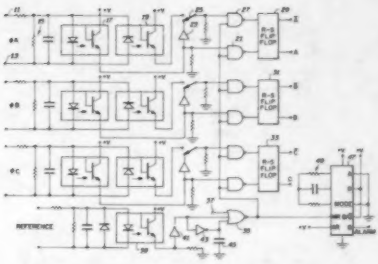
COMPASS DATA CONVERTER

Charles R. Wesner, Crozet, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 6, 1981, Ser. No. 318,702

Int. Cl.³ G01C *17/26*; G06F *15/20*

U.S. Cl. 33—363 R **5 Claims**



1. A compass data converter for use in synchro and step data compass systems having three channels, comprising means to receive modulated pulse trains representative of the instantaneous compass heading reference means for providing enabling pulses synchronized with said modulated pulse trains, register means, gating means responsive to said enabling pulses for switching said register means in accordance with the instantaneous data in each of said three channels, timing means for providing an alarm signal when the time interval between successive enabling pulses exceeds a predetermined value, input/output means, means to apply the output of said register means to said input/output means, counter means, coupled to said register means and said input/output means, to count the number of degrees of net change in compass headings between successive readings, means to apply the output of said counter means to said input/output means, said input/output means being programmed to read information into and out of an external computer.

4,398,354

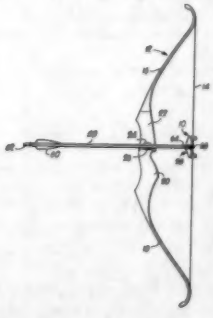
BOW SQUARE HEAD

Robert L. Finlay, Emporia, Kans., assignor to BPE, Inc., Emporia, Kans.

Filed Feb. 8, 1982, Ser. No. 346,630

Int. Cl.³ F41B *5/00*

U.S. Cl. 33—180 R **5 Claims**



1. A device for locating the arrow nocking point on a bow string, comprising:

a member presenting a pair of opposed surfaces;

means projecting from one of said surfaces for engaging a bow string;

structural means positioned centrally of said surfaces and having a first end for removably supporting an arrow nock which engages a bow string when the nock is operatively positioned on the structural means; and

threaded means projecting from a second end of said structural means for threadably receiving the tip end of an elongated arrow.

4,398,355

STEAM DISTRIBUTION APPARATUS

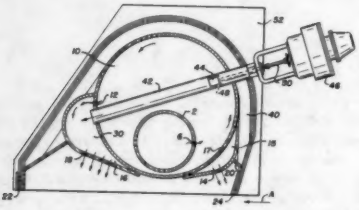
Norman F. Dove, 3187 Hoskins Rd., North Vancouver, British Columbia, Canada 3TJ 3B5

Filed Feb. 25, 1981, Ser. No. 238,249

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ D21F *5/00*

U.S. Cl. 34—54 **1 Claim**



1. A steam distribution apparatus comprising:

a header having means defining an inlet for steam and means defining a first plurality of discrete outlets for steam arranged along the header, the outlets increasing in size with distance from the inlet;

means defining a first chamber surrounding the header to receive steam from the outlets in said header;

means defining first, relatively large outlets in said first chamber;

the relative positions of the header and the first chamber ensuring that, in use, steam leaving said plurality of outlets in the header impinges on the interior of the first chamber and must travel around the first chamber to reach the first outlets in the first chamber;

means defining a second chamber communicating with said first outlets from the first chamber, said second chamber being divided into compartments;

a plurality of pipes each having an inlet communicating with said first chamber and an outlet communicating with a compartment in said second chamber;

a pressure responsive valve actuator associated with each pipe;

a piston attached to each actuator to the pipe outlet at each compartment whereby control of the steam supply from said first chamber to each compartment can be achieved, and thus of steam supply from each compartment;

means defining outlets in said second chamber; and

a shrouding positionable above a paper web and communicating with said elongate outlets in said second chamber whereby in use, controlled steam flow along the entire length of the steam distribution apparatus can be achieved.

4,398,356

MULTI-STAGE DRYER FOR PARTICULATE MATERIAL

Christianus M. T. Westelaken, St. Mary's, Ontario, Canada

Filed Jun. 19, 1981, Ser. No. 275,313

Int. Cl.³ F26B *17/12*

U.S. Cl. 34—65 **6 Claims**

1. A gravity flow dryer for particulate material comprising:

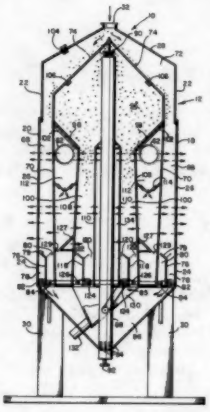
a first generally vertical drying column having first and second opposed spaced perforate walls;

first input means for introducing moist particulate material into a top portion of the first drying column;

first discharge means for removing partially dried heated particulate material from a bottom portion of the first drying column;

a second generally vertical drying column having first and second opposed spaced perforate walls, the first and second drying columns being spaced apart to provide a plenum chamber between the columns, the first perforate walls of each drying column defining the plenum chamber;

second input means for introducing partially dried heated particulate material to a top portion of the second drying column, the second input means including a steeping chamber for steeping the partially dried heated particulate material prior to introduction into the second drying column;



second discharge means for removing dried particulate material from a bottom portion of the second drying column;

conveyor means for receiving the partially dried heated particulate material from the first discharge means and conveying the partially dried heated particulate material to the second input means;

means for providing drying air to the plenum chamber whereby the drying air passes into the first and second drying columns through the first perforate walls to heat and dry the particulate material, the drying air being exhausted from the drying columns through the second perforated walls; and

means for directing a flow of cooling air through a portion of the second drying column to cool the dried heated particulate material prior to its removal from the second drying column.

4,398,357

OUTSOLE

Vijay K. Batra, Sharon, Mass., assignor to Stride Rite International, Ltd., Cambridge, Mass.

Filed Jun. 1, 1981, Ser. No. 270,795

Int. Cl.³ A43B *13/12, 13/16*

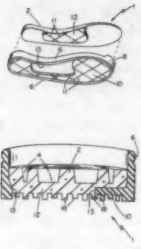
U.S. Cl. 36—30 A **6 Claims**

1. An outsole for a shoe or boot comprising

a first sole component, molded of a relatively dense natural or synthetic rubber composition and having a cut-out shank region, and

a second sole component, of a relatively less dense organic

plastic composition, filling said cut-out shank region of said first sole component,



wherein the bottom surfaces of said first and second sole components form a continuous surface which bears tread of a continuous pattern.

4,398,358

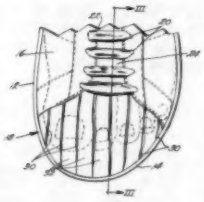
ATHLETIC SHOE

Carl W. Hilton, Muskegon, Mich., assignor to Return on Investment Corporation, Muskegon, Mich.

Filed Mar. 12, 1981, Ser. No. 243,243

Int. Cl.³ A43B *5/00*; A43C *13/14*

U.S. Cl. 36—114 **12 Claims**



1. An athletic shoe adapted for use in playing tennis, racquetball, handball and the like, said shoe comprising:

a sole;

an upper secured to the sole; and

a toe cap secured to the sole and to the upper, said toe cap including a plurality of narrow slit means therein which extend generally longitudinally of said sole for causing said toe cap to spread apart transversely of said sole, provide increased toe room and reduce the chance of injury during sudden stops without an adverse decrease in lateral stability of the shoe.

4,398,359

PLASTIC SKI BOOT

Edward L. Chalmers, II, Boulder, Colo., assignor to Lange International S.A., Fribourg, Switzerland

Filed Feb. 23, 1981, Ser. No. 237,436

Int. Cl.³ A43B *5/04*

U.S. Cl. 36—117 **18 Claims**

1. A plastic ski boot adapted to be releasably attached to a ski comprising a boot upper, a boot lower including a sole having a walking surface at least at the toe and heel, a laterally engageable attachment member mounted on the boot lower between the sole toe and sole heel, plastic forming at least part of the sole, wherein the sole plastic defines at least a portion of the walking surface and acts to vertically space said attachment

member from the walking surface, said attachment member adapted to be releasably secured to a binding on the ski.

4,398,360

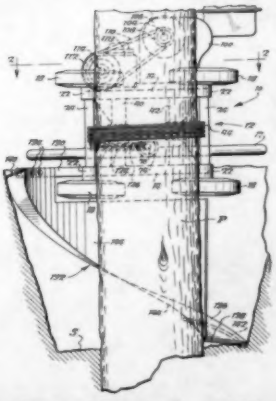
POLE EXCAVATING DEVICE

Donald L. Kessler, Pritchard Rd., Springville, N.Y. 14141

Filed Jan. 25, 1982, Ser. No. 342,114

Int. Cl.³ A01G *23/06*

U.S. Cl. 37—2 R **13 Claims**



1. A device for excavating ground material about an upright pole embedded therein, said device comprising a frame, an auger mounted on said frame, a plurality of rollers rotatably mounted on said frame and engageable with the pole surface, attaching means carried by said frame to attach said device to a pole, said attaching means having a portion thereof adapted to be looped about a pole in a helical path, means for revolving said frame about said pole and along said looped portion of said attaching means, said revolving means including means for gradually displacing said frame in a direction generally parallel to the axis of said pole and in a generally helical path.

4,398,361

RECOVERY OF SEDIMENTS FROM THE BOTTOM OF THE SEA BY SUSPENDED SUCTION PIPE

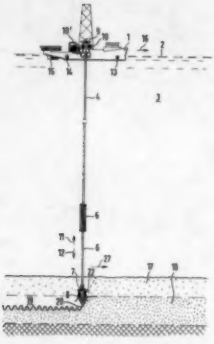
Hans Amann, and Jurgen Burkhardt, both of Hanover, Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,792

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942303

Int. Cl.³ E02F *3/92*

U.S. Cl. 37—57 12 Claims



1. A method for the recovery of sediments from the sea bottom by means of a suspended suction pipe having an upper end and provided at its lower end with a suction head adapted to be slowly lowered into the sediment, said suction head comprising a housing, said housing having openings therein, said suction head having mounted thereon lateral loosening means pivotably movable with respect to said housing at said openings for scraping and disintegrating the sediment, comprising activating the loosening means to scrape and disintegrate the sediment vertically by moving the suction pipe continuously vertically up and down and progressively advancing the suction head laterally forward.

4,398,362

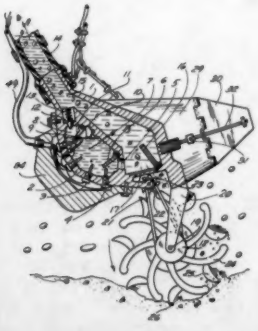
OCEANIC SEAPLOW SYSTEM

Friedrich Weinert, 219-19-131st Ave., Jamaica, N.Y. 11413

Filed Aug. 18, 1982, Ser. No. 409,160

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—61 6 Claims



1. An oceanic seaplow system comprising a plurality of vessels forming a minifleet consisting of a mothership and at least one assistant vessel, a suction turbine mounted adjacent the mothership, a flexible hose having one end connected to the turbine and the other end connected to a suction stud on a seaplow, winch and cable means connecting said hose and said seaplow to said at least one assistant vessel for raising and lowering, at least one air injection means for said hose positioned between said turbine and said seaplow for second stage acceleration, air being delivered to said air injection means by an air pressure hose connected to one of said vessels, means inside said seaplow for creating first stage acceleration by forming gas bubbles by means of electrolysis, a steering system for said seaplow comprising a mobile fin activated by solenoids, an observation T.V. camera mounted on said seaplow in such a fashion that it can be tracked by the mothership as the assistant vessel controls the flexible hose and raises or lowers and steers the seaplow, electric cables connected to and controlled from one of said vessels for supplying power for said electrolysis, said steering system and said T.V. camera, said seaplow comprising a rotatable wheel having a plurality of curved flexible spokes equipped with dipper spoons at the rear of each spoke extending outside of the circumference of the spokes, said wheel converting forward motion and contact with the seabed into rotation in order to dig up specimens which are elevated through rotation of the wheel introduced by surface contact and forward torque of the wheel, a suction opening in said seaplow adjacent said wheel, whereby the contents of the dipper spoons are fed to said suction opening which sucks up all specimens in close range to direct them with the upward current inside the flexible hose in a three stage acceleration including the first stage gas bubble acceleration introduced by electrolysis, the second stage air injection and the third stage suction turbine, and means on board one of the vessels to collect the contents of the hose to be processed.

4,398,363

EARTH MOVING SCRAPER

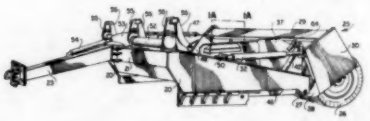
Richard B. Miskin, P.O. Box 218, Ucon, Id. 83454

Filed Oct. 1, 1981, Ser. No. 307,491

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ E02F *3/00*

U.S. Cl. 37—129 5 Claims



1. In an earth-moving, ground leveling and land planing machine having a frame supported by at least two ground engaging wheels at the back end of the frame; a cutting blade disposed laterally between the opposite, longitudinal sides of said frame and adjacent to the bottom of said frame, with the blade positioned so that at least the forward cutting edge thereof is disposed below the bottom of said frame; and a bucket having a floor and upstanding back and side walls, said bucket being disposed with the forward edge of said floor thereof adjacent to the trailing edge of said blade; and a vertically movable apron forming an operable front wall for said bucket, an improvement in said machine wherein:

the apron comprises a swingable gate including a substantially upstanding wall extending transversely of the frame, said upstanding wall being generally concave in shape for strengthening said wall and for aiding the lower edge of said wall to cut through the dirt as the apron is lowered into its closed position said apron further having end walls extending back parallel to and spaced from the outer faces of the side walls of said bucket, with the trailing edge of the end walls of said apron having an arcuate shape with a radius from the pivot axis of said apron about the same as the distance from said pivot axis of said apron to the cutting blade;

means are provided for swinging the apron about a pivot axis which is transverse of the frame, at a vertical distance above the bottom of said frame equal to at least one-half the vertical depth of said bucket and displaced forward of said bucket, whereby when said apron opens, the arcuate portions of the respective end walls swing so that the perimeters of the arcuate portions are always adjacent to the respective ends of the cutting blade; and

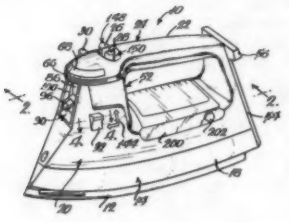
said bucket is adapted to pivot about an axis through the forward edge of said floor thereof from a lowered carrying position in which said floor is substantially horizontal to an elevated dumping position in which said floor is in a forwardly tilted position and vice versa.

4,398,364

STEAM IRON

Robert J. Augustine, Downers Grove, and James C. Mysicka, Berwyn, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 14, 1981, Ser. No. 283,258
Int. Cl.³ D06F 75/18
U.S. Cl. 38—77.5 **11 Claims**



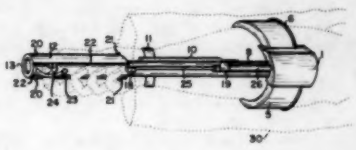
1. A lightweight pressing and steaming iron comprising a soleplate having a heating element provided therein as well as steam passages in communication with steam ports provided in said soleplate, a first plastic housing member mounted on said soleplate and defining the bottom wall of a water reservoir, a second plastic housing member disposed over and secured to said first plastic housing member by a suitable sealant and defining the top and side walls of said water reservoir, said second plastic housing member also defining a tower-like structure at the forward end of the iron and a handle projecting rearwardly from the upper end of said tower, valve means between said water reservoir and said soleplate steam passages including an orifice adapted, when said valve means is open, to provide a predetermined flow of water from said reservoir to said steam passages for normal steam ironing, first and second bellows pumps provided in the upper part of said tower in side by side relationship with the actuating portions thereof projecting upwardly through said handle at the forward end thereof, a spray nozzle on the front of said tower, the outlet port of said first bellows pump being connected to said spray nozzle, the outlet port of said second bellows pump being connected to said steam passages in said soleplate, and the inlet ports of both bellows pumps having inlet tubes extending into the lower rear portion of said reservoir whereby to provide, upon actuation of said first and second pumps, a fine spray from said nozzle and instant extra steam from said steam ports, respectively, with the iron disposed in either a horizontal or a vertical position.

4,398,365

FIREARM

Naum Pokhis, 30-36 Magaw Pl., Apt. 5D, New York, N.Y. 10033

Filed Jul. 23, 1979, Ser. No. 59,748
Int. Cl.³ F41C 9/00
U.S. Cl. 42—1 K **3 Claims**



1. A firearm, particularly a pistol and the like, comprising means for loading cartridges, bullets and the like and including a ring element arranged to surround and to be retained on the forearm of the user;

barrel means arranged to extend over the forearm of the user;

means for displacing the cartridges, bullets and the like to a next firing position;

striking means for striking the displaced cartridge, bullet and the like in the firing position;

means for actuating said displacing and striking means, said actuating means including a bush provided with a trigger and at least two sights and movable between a first position in which it is located in the region of the forearm of the user so as to be concealed under a sleeve of the latter, and a second position in which it is displaced to the hand of the user so that the user can act upon said trigger and use said sights, whereby for firing, only said bush with said trigger and said sights are displaced whereas all other means of the firearm remain inside the user's sleeve; and

means for moving said bush from said first position to said second position by abutting the firearm against an object such as the user's body.

4,398,366

GUN LOCK

John J. Wernicki, 22 E. Gouverneur Ave., Rutherford, N.J. 07070

Filed Nov. 5, 1981, Ser. No. 318,609
Int. Cl.³ F41C 27/00
U.S. Cl. 42—1 LP **7 Claims**

1. A gun lock for a gun having a barrel with a generally cylindrical bore therein and a generally cylindrical chamber for receiving a round of ammunition in alignment with said bore, said lock comprising:

a dummy round rear member dimensioned to fit in said chamber, said rear member having a hollow open forward end and locking ball receiving recess means contiguous with the wall thereof adjacent said open end;

a hollow intermediate rod having an axially movable elongated actuating member therein, said rod being dimensioned to fit in said bore and having an open outer end and an opposite inner end, said inner end having at least two locking balls therein and hole means for permitting said balls to move radially between (i) a free position wherein said balls are disposed within said rod and (ii) a locking position wherein said balls extend from the surface of said

rod, while restraining said balls against axial movement with respect to said rod,

said actuating member having a lock-engaging portion extending from said outer end of said intermediate rod, and a cam portion adjacent the inner end of said rod for engaging said locking balls to (i) urge said balls toward the locking position thereof when said lock-engaging portion of said actuating member is moved away from said inner end of said rod, and (ii) permit said balls to return to the free position thereof when said lock-engaging portion of said actuating member moves toward said inner end of said rod, said inner end of said rod being dimensioned to closely fit in said open end of said rear member so that said balls engage said locking ball receiving recess means in the locking position thereof; and

a lock abutting said outer end of said intermediate rod for detachably engaging said lock-engaging portion of said actuating member, to prevent axial movement thereof toward the inner end of said intermediate rod, thus insuring that said balls remain in locking engagement with said locking ball receiving recess means of said rear member,

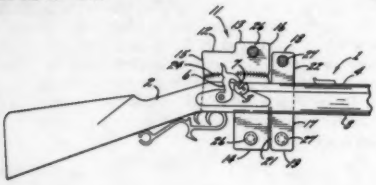
whereby said gun lock occupies said chamber and bore to immobilize said chamber and insure there is no live round therein.

4,398,367

PROTECTOR FOR MUZZLE LOADING RIFLE

Clarence M. Gamble, R.D. #1, Old Youngstown Rd., Edinburg, Pa. 16116, and Frank Stone, Jr., 1706 Gretchen Ave., New Castle, Pa. 16101

Filed Jun. 26, 1981, Ser. No. 277,663
Int. Cl.³ F41C *27/08*
U.S. Cl. 42—1 N **4 Claims**



1. A protector for a muzzle-loading rifle, said rifle having a flint, a forestock, a barrel, a flashpan and a hammer, said protector comprising:

(a) covering means adapted for covering and enclosing said forestock, said hammer and said flashpan; and

(b) a band having a first edge and a second edge and a first end and a second end, said first edge of said band being flexibly secured to said covering means, said band further being able to enclose said barrel and said forestock of said rifle in proximity to said flashpan and hammer; and

(c) fastening means secured to said first end and said second end of said band for interconnecting said first end of said band to said second end of said band when said band encloses said barrel and said forestock.

4,398,368

FISH CATCHER

Chikao Nishi, 6-12, Kaorigaoka 3-cho, Sakai-shi, Osaka-fu, Japan

Filed May 6, 1981, Ser. No. 261,053
Claims priority, application Japan, May 8, 1980, 55/61409
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—15 **5 Claims**

1. A fish catcher comprising:

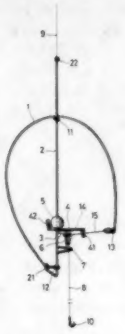
an elastic bent rod;

a center rod mounted on said bent rod and connected to said bent rod at its lower end;

an inward engagement rod pivotally connected to the other end of said bent rod, said engagement rod having a hook ring at its end;

a bracket extending from said center rod secured to said engagement rod;

a swing maker swingably provided on said bracket, said swing maker having a guide ring at its end engaged with said engagement rod and an engagement edge at the other end thereof;



a hook provided downwardly on said bracket;

an inward ring formed directly below said hook on said center rod;

a float provided loosely around said center rod; and

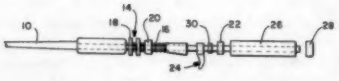
a hook line connected to said inward engagement rod which passes through said inward ring.

4,398,369

FISHING ROD COMBINATION HAVING IMPROVED SENSITIVITY

Kenneth R. Wiebe, 431 Kensington Way, Lodi, Calif. 95240

Filed Feb. 17, 1981, Ser. No. 234,845
Int. Cl.³ A01K *87/00*
U.S. Cl. 43—18.1 **3 Claims**



1. A fishing rod combination, comprising;

an elongated rod,

a handle portion affixed to one end of said rod,

a reel seat assembly spaced forwardly of said handle portion for accommodating a reel,

a finger grip member spaced forwardly of said handle portion, said finger grip member being structurally separate from said handle and said reel seat assembly and including a body portion having a centrally disposed opening for intimately receiving and directly engaging said elongated rod, and means for securely attaching said finger grip member directly to said rod to facilitate communication of the flexing of said rod to said finger grip member; and

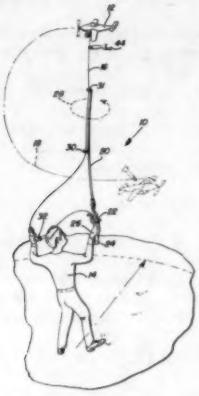
wherein the end of said handle disposed toward said finger grip member includes a recessed portion, and further including an annular hood member disposed within said handle recessed portion in close abutment with said finger grip member and having a bulge portion and an annular bushing positionable within said hood member and having a centrally disposed opening for snugly receiving said elongated rod, said annular hood member cooperating with the outer surface of said annular bushing for supportively receiving a reel tong therebetween.

4,398,370

SINGLE LINE CONTROL UNIT FOR MODEL AIRCRAFT

Joe R. Allen, Rte. 2, Box 1655, Paulding, Ohio 45879

Continuation-in-part of Ser. No. 133,300, Mar. 24, 1980, abandoned. This application Oct. 1, 1981, Ser. No. 307,666
Int. Cl.[3] A63H *27/04*
U.S. Cl. 46—77 6 Claims



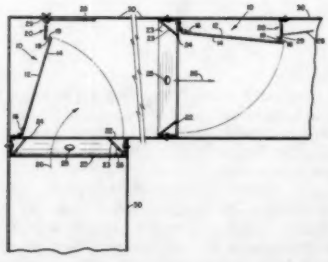
1. In an amusement device comprising a model aircraft attached onto the end of a tethered single control line wherein said control line is held to a rod assembly including a reel means and a flexible rod and wherein said rod includes an eyelet placed adjacent the outer end thereof to hold said control line adjacent said rod and apply with said rod leverage to said control line to propel said model aircraft in the air and maintain a flight path, the improvement comprising an elongated hollow tube slidably mounted about said control line between said reel means and said eyelet, said hollow tube being controllable by hand to control the flight path of said model aircraft, said hollow tube further comprising an interior bearing means contacting said control line passing through said hollow tube, said bearing means being provided adjacent each end of said hollow tube, each of said bearing means comprises an interior trough, said trough being in contact and guiding said control line passing through said hollow tube.

4,398,371

MAGNETIC SMOKE AND FIRE SHIELD

James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207

Filed Aug. 31, 1981, Ser. No. 297,551
Int. Cl.[3] E05F *15/20*
U.S. Cl. 49—7 5 Claims



1. A magnetic smoke and fire shield for controlling the flow of fluid through a conduit, comprising

(a) a frame member adapted for mounting across said conduit, said frame member containing an opening;

(b) a closure member connected with said frame member for movement between open and close positions relative to said frame opening, at least one of same frame and closure members being at least partially formed of a ferromagnetic material;

(c) releasable retaining means including a fusible link and a hook member connected with said fusible link for maintaining said closure member in the open position relative to said frame member, said fusible link being meltable at a predetermined temperature to automatically move said closure member to the closed position, and said hook member being manually releasable from said fusible link to manually move said closure member to the closed position;

(d) manual release actuating means including a length of fire and heat resistance material for manually releasing said hook member from said fusible link; and

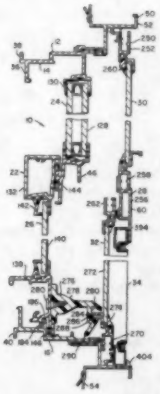
(e) magnetic sealing means mounted on the other of said frame and closure members operable upon release of said retaining means for maintaining said closure member in a closed sealed position relative to said frame opening.

4,398,372

WINDOW STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Company, Owensboro, Ky.

Filed Jun. 21, 1979, Ser. No. 50,818
Int. Cl.[3] E05C *7/02*
U.S. Cl. 49—65 10 Claims



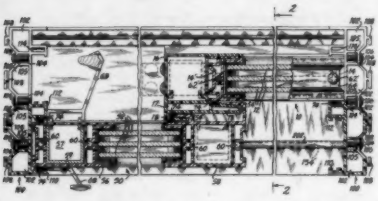
1. Thermal break window structure including a generally rectangular outer frame portion, a generally rectangular inner frame portion and an insulating member positioned between the inner and outer frame portions and cooperable therewith for rigidly securing the frame portions together into a prime window frame without contact between the inner and outer frame portions, said thermal break window structure further including an inner window and an outer window each including corresponding movable sash and further including a sash coupler extending between the inner and outer movable sash for automatically connecting the movable sash together for movement up and down together on relative movement of the sash in one direction to place the movable sash in predetermined alignment.

4,398,373

VINYL FRAME, MULTI-PANEL, SLIDING DOOR ASSEMBLY

Paul Mancuso, Mamaroneck, N.Y., assignor to Fiberlux Products, Inc., Mount Vernon, N.Y.

Filed Nov. 28, 1980, Ser. No. 210,514
Int. Cl.³ E05D *13/02*
U.S. Cl. 49—425 16 Claims



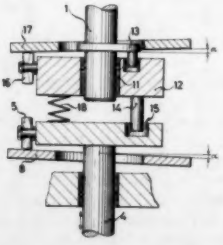
1. A frame assembly for a door having at least one sliding panel comprising a pair of elongated upright frame members formed of rigid plastic, a pair of elongated horizontal frame members formed of rigid plastic, means for rigidly attaching said horizontal members to said upright members to form a frame, and guide means on said frame members for supporting said panel and for moving said panel longitudinally between closed and open positions, wherein each said member is formed to have, in cross-section, a series of laterally contiguous hollow sections cooperating to render each frame member rigid over its entire length and forming a rigid frame assembly which is capable of supporting a sliding door assembly; wherein said series in one of said upright frame members and said horizontal frame members comprises a plurality of in-line, first hollow sections, separated by smaller, second hollow sections arranged to accept attaching screws, wherein said second hollow sections maintain the rigidity of said frame members and are capable of withstanding compressive and bending forces associated with attaching the horizontal and vertical frame members together at said second hollow sections.

4,398,374

POLISHING MACHINE HAVING A ROTARY RECIPROCATING SHAFT

Franz Amann, Regensburg, and Peter Listl, Sinzing, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Reinhausen Gebrüder Scheubeck GmbH & Co. KG, Regensburg, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,331
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1981, 3029417
Int. Cl.³ B24B *7/00*; F16H *37/16*
U.S. Cl. 51—31 7 Claims



1. A polishing machine for performing polishing operations and similar operations involving rotary motions and simultaneous oscillatory motions by a shaft in a direction longitudinally thereof, said machine comprising

(a) a rotatable driven shaft;

(b) a tool-supporting shaft arranged in coaxial relation to and spaced from said driven shaft;

(c) a solid of rotation surrounding said driven shaft;

(d) a first crank shaft mechanism driven by said driven shaft positively transmitting the rotary motions thereof to said solid of rotation;

(e) a first bearing projecting in cantilever fashion from said solid of rotation and rotating jointly with said solid of rotation;

(f) a first control plate being engaged under pressure by said first bearing and inclined in one direction to the common geometrical axis of said driven shaft and said tool-supporting shaft thereby imparting oscillatory motions to said solid of rotation in a direction longitudinally of said driven shaft;

(g) a first slide bearing in said solid of rotation for said driven shaft;

(h) means jointly rotatable with said tool-supporting shaft at the end thereof remote from its tool-supporting end;

(i) a second crank shaft mechanism driven by said solid of rotation positively transmitting the rotary motions thereof to said means jointly rotatable with said tool-supporting shaft;

(j) a second bearing projecting in cantilever fashion from said means jointly rotatable with said tool-supporting shaft and rotating jointly with said tool-supporting shaft;

(k) a second control plate being engaged under pressure by said second bearing and inclined in a direction opposite to said one direction to the common geometrical axis of said driven shaft and said tool-supporting shaft thereby imparting oscillatory motions to said tool-supporting shaft in a direction longitudinally thereof and of opposite phase than the oscillations of said solid of rotation; and

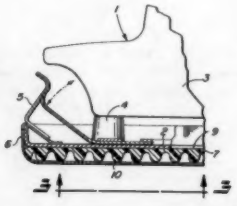
(l) a second fixed slide bearing supporting said tool-supporting shaft.

4,398,375

HIGH SPEED POWER SANDER AND SANDING PAD THEREFOR

John Malyuk, 25670 Zeman Ave., Euclid, Ohio 44132

Filed Dec. 24, 1981, Ser. No. 334,155
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—170 TL 6 Claims



1. A high speed power sander having an oscillating back-up plate to which one side of a sanding pad 30 to 40 Durometer hardness resiliently deformable elastomeric material is secured; said pad having on the other side numerous integral spaced apart discrete laterally projecting generally cylindrical fingers of height at least as great as the diameter thereof and terminating in coplanar rounded ends; and means on said plate for detachably securing thereto the ends of a strip of sandpaper with the uncoated side engaged with, but unsecured to, said rounded ends whereby said fingers constitute a resilient support for the sandpaper when pressed against work to be sanded and are flexed to cause the rounded ends thereof to exert a massaging action on the sandpaper to prevent clogging thereof

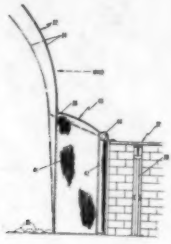
by sanded material of the work and to form a smooth finish on the work.

4,398,376

FABRIC PANEL UNIT

Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air-Tech Industries, Inc., Clifton, N.J.

Continuation of Ser. No. 683,098, May 4, 1976, abandoned. This application May 6, 1977, Ser. No. 794,337
Int. Cl.³ E04B *1/34, 1/00*
U.S. Cl. 52—2 2 Claims



1. A fabric panel unit comprising in combination two arch shaped spaced structural elements, a fabric panel extending between the structural elements in a relatively slack condition and secured to the structural elements, said panel including at least a first portion having an edge connected to one of said structural elements and a second portion having an edge connected to another of said structural elements, said first and second portions extending from their connected edges toward each other, and pocket means being elongated and formed in said panel between said first and second portions, said pocket means including first and second layers of fabric joined together along opposite edges thereof to form a pocket, said first layer comprising a portion of the fabric panel which extends between the structural elements means providing an air impervious inflatable gas envelope in said pocket, said first and second fabric layers being of substantially similar dimensions and both being unconstrained except at said edges, said first layer forming at least about half of the active surface area of the pocket so that when said envelope is inflated with gas said pocket distends by the deformation of both said first and second fabric layers, with the deformation of said first layer acting to shorten said panel and remove slack therein, said pocket being elongated and extending along said fabric panel in a direction transverse to the desired tension forces and extending generally parallel to said arches and positioned with respect to said structural elements so that upon inflation the tension in the panel lies along a line which substantially bisects the distended pocket, whereby a frame and fabric structure can be easily erected in a slack condition and subsequently be tensioned by inflating said envelope.

4,398,377

STRUCTURAL MEMBER WITH EQUALIZED INTERNAL TENSION

Byron A. Romig, Jr., 3920 Eagle Rock Blvd., Los Angeles, Calif. 90065

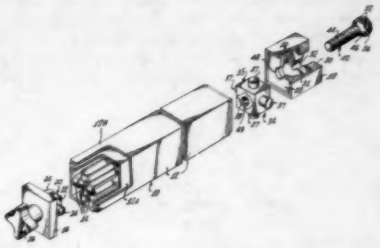
Continuation-in-part of Ser. No. 115,502, Jan. 25, 1980, Pat. No. 4,313,287. This application Nov. 20, 1981, Ser. No. 323,409
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.³ E04C *3/10*
U.S. Cl. 52—223 R 15 Claims

1. A structural member comprising:

an elongated body shell formed by fibers and a bonding medium, said body shell having an open interior extending axially throughout between two ends;

a pair of end pieces disposed at said ends;

a plurality of elongated bands axially disposed within said shell;



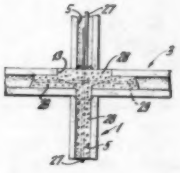
anchor means for securing said bands to at least one of said end caps including a pull member and a distribution member pivotably movable relative to said pull member to at least partially equalize the tension on said bands.

4,398,378

BUILDING CONSTRUCTION SYSTEM COMPONENT PARTS AND METHOD FOR ASSEMBLING SAME

Charles J. Heitzman, Honolulu, Hi., assignor to Auto-Cast International, Ltd., Honolulu, Hi.

Filed Sep. 24, 1980, Ser. No. 190,381
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—251 4 Claims



1. A building construction system comprising:

(a) a plurality of prefabricated wall panels each constructed of self-hardening material and comprising a substantially flat, elongated, rectangular slab provided therein with a plurality of open, longitudinal cylindrical interior cells for receiving reinforcing rods and grout, at least one longitudinal side of each panel being provided with a substantially half-round channel extending thereacross centrally in the longitudinal direction of the panel to form a cell and permit the introduction of grout when two or more panels are erected and abutting one another; and

(b) a plurality of pre-fabricated floor panels, supported by the aforesaid wall panels and constructed of self-hardening material and comprising a substantially flat, elongated, rectangular slab provided with a plurality of open longitudinal, cylindrical interior cells for receiving reinforcing rods, electrical conduit, and the like, at least one longitudinal side of each floor panel being provided with a substantially half round channel extending thereacross centrally in the longitudinal direction of the floor panel to form a cell when two or more floor panels are erected and longitudinally abutt one another, the corresponding upper longitudinal edges thereof being spaced inwardly from the abutting lower longitudinal edges of adjacent panels to facilitate the introduction and retention of grout into substantially cylindrical cells formed by said abutting panels when the grout is introduced from the top of two adjacent floor panels, the transverse ends of each floor panel being notched from the top surface thereof to facili-

tate the introduction of grout when the ends thereof are supported by and secured to corresponding wall panels by grout and horizontal and vertical tie rods; and

(c) horizontal and vertical reinforcing rods respectively disposed within cells of said floor panels and wall panels and connected to one another and rigidly secured therebetween and to said panels by means of grout introduced to the cells and to the junctions between said walls and floor panels.

4,398,379

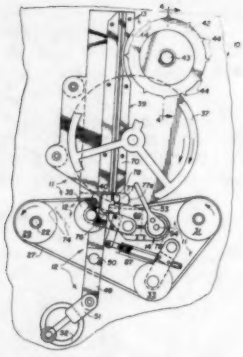
TAB ATTACHMENT DEVICE

Charles E. Burford, P.O. Box 714, Maysville, Okla. 73057

Filed Mar. 11, 1981, Ser. No. 242,443

Int. Cl.³ B65B *51/08, 57/04*

U.S. Cl. 53—77 **3 Claims**



1. A device for attaching a tab having a central opening and a bag receiving passage formed therein, about the gathered neck of a flexible bag, said device comprising: conveyor means to flatten a portion of the bag adjacent the open end of the bag, to form a flattened bag neck, and to move the flattened bag along a path; tab support means movably mounted adjacent said path to support a tab such that the conveyor means moves the flattened neck into a bag receiving passage in the tab; tab positioning means movably mounted in said bag path urging said tab into engagement with said tab support means; and anti-jam means operably connected between said tab positioning means and said tab support means for moving said positioning means out of said path responsive to movement of said support means away from said path on its engagement with a neck which is too large to enter the bag receiving passage in the tab along said path .

4,398,380

PACKING APPARATUS

Yoshiyuki Takamura, Nagoya, Japan, assignor to Fuji Pack System Ltd., Japan

Filed May 12, 1980, Ser. No. 148,069

Claims priority, application Japan, Oct. 17, 1979, 54-134830

Int. Cl.³ B65B *45/00, 47/10, 67/08*

U.S. Cl. 53—390 **5 Claims**

1. Apparatus for packaging items with a unitary wrapping film comprising

a package chamber having an upper opening and a base opening;

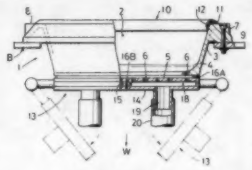
a pair of suction chambers;

means for mounting said pair of suction chambers adjacent said bottom opening;

means for moving said pair of suction chambers so as to close and open said base opening so as to form said wrapper film when closed and dispense said film containing said items when open;

a plurality of vent holes in said suction chambers;

a holding ring replaceably mounted about the edge of said upper opening in said package chamber said holding ring being of a material which frictionally retains a sheet of



said wrapping film without additional retaining means; and

suction means connected to said suction chambers for drawing the central area of said film into said package chamber when said suction chambers are in a closed position and while said film is being peripherally frictionally retained by said holding ring.

4,398,381

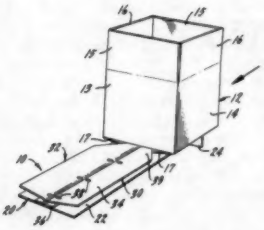
CARTON PACKING STATION FIXTURE

Lawrence W. Ulrich, and Connie W. Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed Dec. 24, 1980, Ser. No. 219,823

Int. Cl.³ B65B *67/00*

U.S. Cl. 53—393 **1 Claim**



1. A lightweight, portable carton packing station fixture for retaining the side and end bottom flaps of cartons of different sizes in their infolded position without adjustment to facilitate filling of the carton; comprising:

(a) a longitudinally extending base plate means;

(b) a pair of longitudinally extending flap retaining flange members extending upwardly from the longitudinal center axis of a carton filling portion of said base plate means, said flap retaining flange members include infeed end portions which are wedge shaped and incline downward towards said base plate means, said flap retaining flange members incline downwardly towards the longitudinal axis of said plate means at which point the inner edges thereof turn downward and then outward a short distance so as to form a securing flange portion to secure said flap retaining flange;

(c) said flap retaining flange members being spaced a short distance from said base plate means so as to permit receipt and retension of a corresponding side bottom flap therebetween while the upper surfaces of said flap retaining flange members prevent downward movement of a corresponding end bottom flap such that the side and end bot-

tom flaps are retained in their infolded position so as to permit filling of the carton;

(d) said flap retaining flange members having infeed ends which terminate a distance from the infeed end of said base plate means so as to form a carton set-up and support portion integral with said base plate means; and

(e) a carton set-up plate member rigidly secured to the upper surface of said carton set-up and support portion, said carton set-up plate member having a centering flange extending upward therefrom along the center axis thereof for serving as the sole means for centering of the carton prior to its being received by said flap retaining flange members.

4,398,382

METHOD FOR WASHING AND COATING AS WELL AS FOR DOSAGE OF EIA-RINGS AND A DEVICE FOR CARRYING OUT THE METHOD

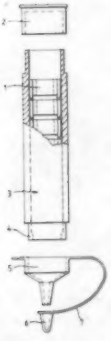
Osmo A. Suovaniemi; Jukka Tervamäki; Jukka Suni, and Paul Partanen, all of Helsinki, Finland, assignors to Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi, Finland

Filed Apr. 8, 1981, Ser. No. 252,180

Claims priority, application Finland, Apr. 28, 1980, 801355

Int. Cl.³ B65B *3/00*; **C12M** *1/00*; **B01L** *11/00*

U.S. Cl. 53—431 **3 Claims**



1. A method of contacting with a liquid solution annular pieces used in research and for storing and dispensing same, comprising the steps of:

(I) the liquid contacting steps including:

(a) fitting said annular pieces in a tubular container means, said container means stacking said annular pieces, said container means having upper and lower ends and being open at both ends and including retention means at the lower end for preventing said annular pieces from falling from said container;

(b) fitting said upper end of said container to a liquid intake and discharge means;

(c) fitting said lower end of said container means with releasable tip means;

(d) drawing said liquid solution into said container means by said liquid intake and discharge means;

(e) exhausting said liquid solution from said container by said liquid intake and discharge means;

(II) the storing steps including:

(f) removing said liquid intake and discharge means from said container means;

(g) releasably capping the upper end of said container means and the lower end of said tip means;

(III) the dispensing steps including:

(h) removing the caps and tip means;

(i) fitting said container means to a dispensing means, said dispensing means including means for selectively overcoming said retention means; and

(j) dispensing said rings from said container.

4,398,383

APPARATUS FOR PACKAGING PRODUCT FILLED SEALED BAGS INTO CASES

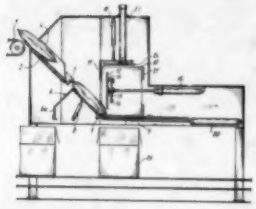
Bouwe Prakken, Kamerik, Netherlands, assignor to Allen Fruit Co., Inc., Newberg, Oreg.

Filed Feb. 10, 1981, Ser. No. 233,041

Claims priority, application Netherlands, Mar. 12, 1980, 8001469

Int. Cl.³ B65B *35/32, 35/40, 35/44*

U.S. Cl. 53—537 **7 Claims**



1. An apparatus for packaging product-filled sealed bags in an upright position in packing cases comprising:

means for arranging a predetermined number of bags in a row;

a movable bottom plate capable of supporting at least one row accumulated thereon;

means for delivering the row from the arranging means to the bottom plate;

means for positioning the row in an upright position on the bottom plate;

means for supporting the row on the bottom plate in the upright position by applying a lateral gripping force to opposite sides of the row;

means for moving the bottom plate to a non-supporting position after the row has been gripped; and

a vertically movable pushing plate operable to push the row in its upright position downwardly into an open, underlying packing case after the bottom plate is moved to its non-supporting position.

4,398,384

CROP CONDITIONING APPARATUS AND METHOD

Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

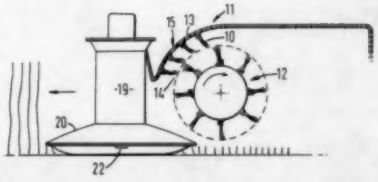
PCT No. PCT/GB79/00053, § 371 Date Nov. 30, 1979, § 102(e) Date Nov. 30, 1979, PCT Pub. No. WO79/00863, PCT Pub. Date Nov. 1, 1979

PCT Filed Mar. 30, 1979, Ser. No. 173,136

Claims priority, application United Kingdom, Mar. 31, 1978, 12703/78

Int. Cl.³ A01D *14/02*

U.S. Cl. 56—14.5 **25 Claims**



1. Crop conditioning apparatus comprising:

a frame having a passage for crop to be conditioned; and

first and second conditioning devices positioned substantially opposite each other on opposed sides of the crop passage;

in which each crop conditioning device is in the form of a rotor and comprises a brush-like structure having a multiplicity of stiff, resilient, elongate conditioning elements for conditioning the crop by an action consisting predominantly of surface damage to the crop, the elements being yieldable in response to engagement with the crop, and being yieldable at least predominantly by bending of the elements along at least part of the crop engaging portions of the lengths thereof, and the elements being sufficiently stiff to return to their undeflected dispositions when free from engagement with crop at least predominantly by virtue of the stiffness of the elements; and

in which the rotors are arranged to be rotated in contra-rotation with the same peripheral speed at the tips of the elements, and the rotors are sufficiently close and the elements sufficiently stiff to cause conditioning of the crop predominantly by a spiking action of the tips of the elements in which the stiff elements of each rotor force crop onto the tips of the stiff elements of the other rotor.

4,398,385

PIVOTABLE SPINDLE MOUNTING

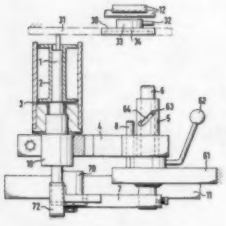
Rainer Studtmann, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,371

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040124

Int. Cl.³ D02G *3/28;* D01H *1/241*

U.S. Cl. 57—18 **9 Claims**



1. A pivotal spindle mounting, provided on a machine frame, in particular for a wrap spinning apparatus having a spindle mounted on a pivot arm, said pivot arm being mounted on a support bolt, the improvement comprising:

means for rotatably mounting said support bolt on said machine frame;

means for rotating said support bolt providing a pivotal motion to said pivot arm and spindle and applying a counter-force to the pivotal motion converting said pivotal motion of said spindle into a lifting motion.

4,398,386

PROCESS AND APPARATUS FOR SIMULTANEOUSLY DRAWING AND FALSE-TWISTING THERMOPLASTIC SYNTHETIC YARN

Tetsuhiko Endo, Kyoto; Kunihiko Ueda, and Tadashi Kohara, both of Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

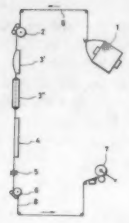
Filed Apr. 20, 1981, Ser. No. 255,854

Claims priority, application Japan, Apr. 23, 1980, 55-54791

Int. Cl.³ D02G *1/02, 1/16*

U.S. Cl. 57—288 **13 Claims**

1. A process for drawing and false-twisting a thermoplastic synthetic yarn comprising simultaneously drawing an undrawn or a partially drawn yarn under a dry hot condition while false-twisting the same, and immediately thereafter heat-setting the yarn under a wet hot condition in an atmosphere of saturated or superheated water vapor prior to untwisting of the yarn.



4,398,387

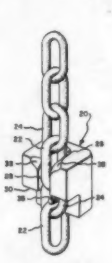
CHAIN TRAVEL STOP

James F. Bary, Snyder, N.Y., assignor to Columbus McKinnon Corporation, Amherst, N.Y.

Filed Mar. 8, 1982, Ser. No. 356,029

Int. Cl.³ F16G *15/00*

U.S. Cl. 59—93 **7 Claims**



1. For use in a chain hoist system or the like including hoisting means and a chain strand depending therefrom, a chain strand stop device adapted to be detachably mounted upon any selected one of the interconnecting links of said chain strand for limiting the travel of said chain strand relative to said hoisting means;

said device comprising a block formed of rigid metal and having a first slot extending throughout its height and entering said block from one side thereof and terminating short of the opposite side thereof;

the lower portion of said block at said first slot entry side of said block being cut away to the depth of said first slot so as to provide at the upper portion of said block a pair of shoulder portions straddling said first slot and overhanging the bottom cut-away portion of said block;

a pair of second slots formed in said shoulder portions disposed transversely of said first slot and extending from the bottom surfaces of said shoulders vertically therefrom into said block but terminating short of the top surface of said block as well as of the opposed wall portions of said block, whereby said second slots are adapted to accommodate therein the chain next below a chain link accommodated in said first slot and the ceiling portions of said second slots overhang and capture therewithin said next below chain link;

and fastener means manually controllable so as to extend through a side wall portion of said block into the cut-away portion of said block beneath the shoulders thereof for retaining a chain link of said strand when disposed within said second slots in order to operationally maintain said block in mounted relation upon said chain strand; said

fastener means being also retractable to permit disengagement of said block from said chain strand.

4,398,388

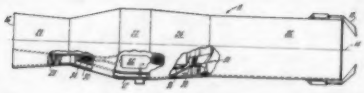
HIGH BYPASS RATIO SUPPLEMENTAL FUEL INJECTION

Chandos E. Langston, Jr., Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 754,770, Dec. 27, 1976, abandoned. This application Jan. 21, 1981, Ser. No. 226,579

Int. Cl.³ F02K *3/10*

U.S. Cl. 60—241 **10 Claims**



1. In combination in a bypass engine, a core engine, a bypass duct around said engine, said core engine having a first exhaust means, said bypass duct having a second exhaust means, an afterburner, said first and second exhaust means opening into said afterburner, said afterburner having an outer wall, flameholder means in said afterburner downstream of said first and second exhaust means, afterburner fuel supply means, said afterburner fuel supply means comprising a plurality of nozzle means for injecting fuel to said afterburner at a plurality of predetermined locations and at predetermined times, fuel control means including means for directing fuel to each nozzle means at each of said plurality of predetermined locations in a desired sequence, the nozzle means being the last in the sequence having first nozzles for directing fuel into said afterburner at a spaced distance from the outer wall of said afterburner, second nozzles for directing fuel into said afterburner at a location within said spaced distance, means for directing fuel to said second nozzles at a bypass ratio which will provide excess air for the burning of the fuel to prevent adversely affecting the outer wall, said fuel control means having a first conduit means for directing fuel to said first nozzles, second conduit means connecting said first conduit means to said second nozzles, said means for directing fuel to said second nozzles including valve means in said second conduit means for controlling the flow of fuel to said second nozzles, means for opening said valve means when a Mach No. is reached which indicates a bypass ratio containing excess air which is sufficient to burn the fuel directed into the afterburner without adversely affecting the outer wall.

4,398,389

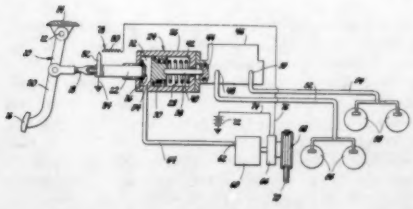
DEMAND TYPE POWER BRAKE SYSTEM

Robert A. Horvath, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1981, Ser. No. 246,233

Int. Cl.³ F15B *7/00*

U.S. Cl. 60—545 **4 Claims**



1. A power brake system comprising:

a master cylinder,

a power brake booster operable to actuate said master cylinder,

a brake pedal movable to control the operation of said booster and to act through said booster on said master cylinder to actuate said master cylinder,

a fluid pressurizing pump fluid connected to said booster to selectively provide fluid pressure thereto for operating said booster,

a rotating driving power source,

means selectively delivering driving power from said driving power source to operate said pump, said means including selectively and variably energizable clutch means for determining the amount of driving power delivered to said pump and thus controlling the amount of fluid pressure delivered by said pump to operate said booster,

and control means for variably energizing said clutch means, said control means being responsive to brake actuating movement of said brake pedal to cause energization of said clutch means corresponding to the brake pedal position reflecting the amount of master cylinder actuation desired by the operator.

4,398,390

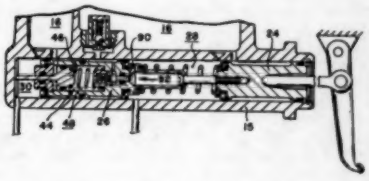
MASTER CYLINDER WITH FAST FILL AUXILIARY CHAMBER WITHIN A PISTON

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 155,352, Jun. 2, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,382

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **3 Claims**

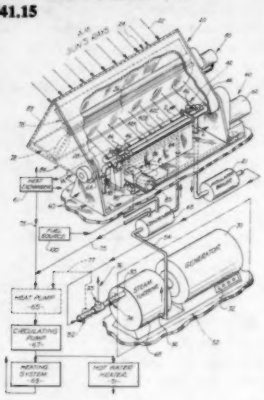


1. In a fast-fill master cylinder, a housing forming a reservoir containing fluid and a bore movably receiving a pair of pistons, the bore including a wall forming a substantially uniform diameter extending over the entire length of the housing, the pair of pistons cooperating with each other and with the housing to substantially define a pair of pressure chambers which normally communicate with the reservoir in a rest position for the pair of pistons, one of the pair of pistons defining an internal auxiliary pressure chamber within the one piston normally communicating with the reservoir via a passage having a valve assembly therein, the auxiliary pressure chamber receiving a position sensitive member cooperating with the one piston to contract the auxiliary pressure chamber in response to movement of the one piston away from the rest position, and check valve means carried by the one piston permitting one way fluid communication from the passage to one of the pair of pressure chambers, the one piston being movable initially away from the rest position during a brake application to generate fluid pressure within the auxiliary pressure chamber, the check valve means providing less restriction to fluid flow than the valve assembly when the fluid pressure generated in the auxiliary pressure chamber is below a predetermined value so that the generated fluid pressure is communicated to the one pressure chamber via the check valve means when the generated fluid pressure level is below the predetermined value and communicated to the reservoir via the valve assembly when the generated fluid pressure level is above the predetermined value.

4,398,391
SOLAR ENERGY CONVERSION APPARATUS PROVIDED WITH AN AUTOMATIC CUT-IN HEAT-SUPPLYING STANDBY APPARATUS

Edgar English, Jr., 45125 Redwood Ave., Lancaster, Calif. 93534

Filed Jun. 2, 1980, Ser. No. 155,794
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.³ F01K *7/02*
U.S. Cl. 60—641.15 **10 Claims**

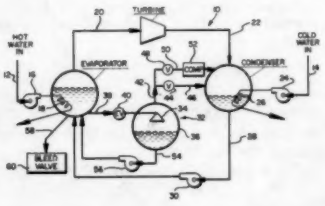


1. An improved solar energy conversion apparatus for effectively converting solar radiation thermal energy into stored thermal energy contained in a captive working medium in a closed-cycle power conversion system and including auxiliary heating apparatus coupled thereto in a manner such as to provide a substantially constant desired level of thermal energy input into the working medium of the closed cycle power conversion system despite input solar radiation thermal energy variations, comprising: radiation-concentrating optical means operable to receive input solar radiation as input energy from a relatively large area input region and in relatively diffuse form and to modify same into concentrated output radiation of an effectively high-thermal energy density type in a relatively smaller area, radiation output, concentrated heated region; heat transfer and energy conversion means positioned in said smaller area radiation output, concentrated heat transfer region and having an outer radiation reception surface adapted to be impinged by the area-reduced, effectively energy-density-concentrated output radiation from said radiation-concentrating optical means and having a thermally-efficient radiation-to-heat conversion layer operable to convert a large portion of received concentrated infrared radiation into heat in a containment region on the inner side of said surface and in a working medium contained therein; said outer radiation reception surface being thermally conductively provided with and attached to a closed-cycle containment apparatus having an inner contact surface and having a working medium circulation system and further having a working medium contained therein and in inner heat transfer relationship with said inner contact surface thereof adjacent to and opposed to said outer radiation reception surface; said closed-cycle containment apparatus comprising a number of series-connected hollow flow sections provided with intervening one-way check valve means therebetween allowing the passing of a progressively heated working medium through said valve means and the corresponding flow sections of said containment apparatus in one forward direction only; succeeding flow sections of said containment apparatus between succeeding sets of said one-way valve means being placed for individual reception of corresponding different quantities of line-focused solar radiation for incremental heating in a series manner of the working medium in successive flow sections of the containment apparatus whereby to incrementally increase the temperature and pressure of the working medium along the complete length of said containment apparatus until it reaches a desired high temperature and pressure at a thermal-energy-output-utilization end thereof; and controllably operable auxiliary heating means in heat transfer relationship with respect to some portion of said containment apparatus and the working medium contained therein and normally being inoperative but being provided with heat-sensing means in controlling relationship with respect to said auxiliary heating means and in heat-sensing relationship with respect to said containment apparatus and the solar-energy-heated working medium contained therein whereby a reduction in the heating effect produced by the radiation-concentrating optical means below a preselected level will be sensed by said heat-sensing means and will automatically start the operation of said auxiliary heating means and will subsequently control the level of operation thereof so as to substantially maintain a preselected level of heat transfer from the combination apparatuses into said closed-cycle containment apparatus and the working medium contained therein, said containment apparatus having an effective output thermal-energy-utilization end thereof adapted to be connected to some desired form of thermal energy utilization apparatus adapted to effectively reduce the temperature and pressure of the working medium as a consequence of the effective extraction of substantial quantities of energy from the working medium by such thermal energy utilization apparatus; and a return flow line adapted to be connected from an output side of such a thermal energy utilization apparatus back to a low-energy input end of said containment apparatus on an upstream end of the portion thereof adapted to be heated by said radiation-concentrating optical means and/or said auxiliary heating means.

4,398,392
SYSTEM FOR SEPARATION OF WATER FROM THE WORKING FLUID IN LOW TEMPERATURE DIFFERENCE POWER PLANTS

Ejup N. Ganic, Oak Park, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Sep. 10, 1981, Ser. No. 300,988
Int. Cl.³ F01K *25/10*
U.S. Cl. 60—657 **11 Claims**



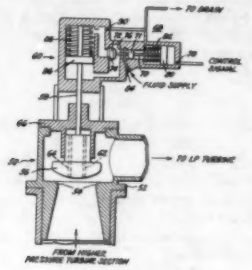
1. In a low temperature difference power generating system, including an evaporator, a condensor and a working fluid having a relatively low boiling point, the improvement of means for removing foreign fluid from said working fluid during non-operation of said power generating system, said improvement comprising a flash separator unit for vaporizing said working fluid and separating said vaporized working fluid from said foreign fluid, first conduit means for coupling working fluid and foreign fluid from said evaporator to said flash separator unit, and second conduit means for coupling said vaporized working fluid from said flash separator unit to said condensor.

4,398,393

STEAM TURBINE CONTROL APPARATUS

Peter G. Ipsen, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,528
Int. Cl.³ F01D 21/02
U.S. Cl. 60—657 9 Claims



1. In combination with a steam turbine in which steam exhausted from a higher pressure turbine section is passed through an interconnecting steam conduit to a lower pressure section, a system for controlling overspeed in the turbine following a sudden loss in load, comprising:

at least one valve disposed in the steam conduit to receive steam from said higher pressure section at an inlet port of said valve and to discharge steam to said lower pressure section at an outlet port of said valve; and

an actuator for controlling operation of said valve between a fully open position and a pressure-relief position wherein said valve is responsive to be open only when the steam pressure at said inlet port is greater than the steam pressure at said outlet port by a preselected amount, said actuator being responsive to a turbine overspeed signal generated in response to said sudden loss in load to cause said valve to be operated in said pressure-relief position.

4,398,394

PROCESS FOR PREPARING GASIFIED ICE OF IMPROVED STABILITY

Fredric Kleiner, Valley Cottage, N.Y.; William R. Ramakka, Little Ferry, N.J., and Valery B. Zemelman, Wilton, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,887
Int. Cl.³ F25C 1/00
U.S. Cl. 62—1 16 Claims

1. A process for preparing gasified ice characterized by a high degree of mechanical strength in its frozen state, a high gas content, prolonged storage stability suitable for commercial distribution in its frozen state, and a vigorous, uniform effervesence when placed in water, which comprises:

(a) contacting water ice with a conditionally-stable-hydrate-forming gas under conditions of temperature and pressure capable of forming a hydrate complex of the gas, said temperature being below the freezing point of water and said pressure being at least sufficient to enable formation of said hydrate but insufficient to liquefy said gas at the temperature of contact;

(b) maintaining said contact for a period of time effective to form gas hydrate complex within said ice;

(c) contacting said water ice containing gas hydrate, under conditions of temperature and pressure effective to maintain said hydrate in stable form, with a sufficient amount of aqueous liquid to wet all exposed surfaces of said ice; and

(d) freezing said aqueous liquid to enrobe said gas hydrate ice.

4,398,395

CARBONATED ICE PROCESS AND PRODUCT

David C. Hinman, Tarrytown, N.Y.; Valery B. Zemelman, Wilton, Conn., and William R. Ramakka, Little Ferry, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,888
Int. Cl.³ F25C 1/00
U.S. Cl. 62—1 15 Claims

1. A process for preparing carbon dioxide hydrate which comprises:

(a) contacting water ice with a carbon dioxide gas at a temperature within the range of from about −20° C. to about 0° C. at a pressure of about 0.3 times the CO_2 vapor pressure at the respective temperatures, the pressure being at least sufficient to cause formation of carbon dioxide hydrate, but insufficient to liquefy the carbon dioxide; and

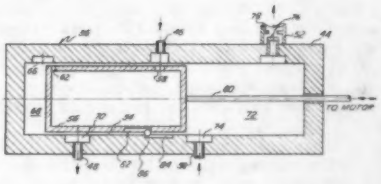
(b) maintaining contact for a period of time effective to form carbon dioxide hydrate in the ice.

4,398,396

MOTOR-DRIVEN, EXPANDER-COMPRESSOR TRANSDUCER

Lawrence J. Schmerzler, 539 Laurel Pl., South Orange, N.J. 07097

Continuation-in-part of Ser. No. 914,882, Jun. 12, 1978, Pat. No. 4,208,855, which is a continuation-in-part of Ser. No. 417,958, Nov. 21, 1973, Pat. No. 4,094,169, which is a continuation of Ser. No. 59,306, Jul. 29, 1970, abandoned. This application Jun. 23, 1980, Ser. No. 161,769
Int. Cl.³ F25B 1/02; F04B 35/00
U.S. Cl. 62—116 7 Claims



1. An improved expander-compressor transducer for expanding refrigerant fluid from a high pressure source into a low pressure heat absorbing heat exchanger while simultaneously compressing the same fluid stream derived from the low pressure heat absorbing heat exchanger, said expander-compressor transducer having:

a body member enclosing a chamber for confinement of a refrigerant;

fluid responsive piston means arranged to oscillate in said chamber and dividing said chamber into an expansion chamber at one end and a compression chamber at the other end;

fluid control regulating means for permitting flow of refrigerant fluid into and out of said expansion chamber and into said compression chamber; and,

check valve means for permitting refrigerant flow out of said compression chamber whenever the pressure in said compression chamber is higher than the fluid pressure immediately downstream of said check valve means;

wherein said improvement is characterized by:

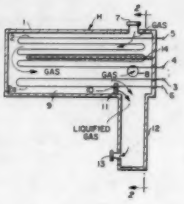
motive means for oscillating said piston means within said chamber and causing said gaseous fluid to expand in said expansion chamber and concurrently to compress in said compression chamber;

thereby producing simultaneously cooling and heating effects.

4,398,397
SELF-BALANCING TWO STAGE HEAT RECOVERY SYSTEM

Walter A. Hans, Cherry Hill, N.J., assignor to Penjerdel Refrigeration Co., Inc., W. Conshohocken, Pa.

Filed Apr. 27, 1981, Ser. No. 258,030
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 23 Claims



1. A system for heating a fluid from heat released during the condensing of a superheated condensible heat exchange medium supplied by a source of such medium, the system comprising:

means for conveying said fluid in a first direction from a fluid inlet downstream to a fluid outlet; and

means for circulating said heat exchange medium around said conveying means in the opposite direction in a heat exchange relationship to transfer to said fluid, first, the heat of subcooling condensed heat exchange medium, second, the latent heat of said heat exchange medium, and, finally, the superheat of said heat exchange medium, whereby said heat exchange medium flows countercurrent to the flow of said fluid such that said fluid is initially exposed to the heat exchange medium at the coolest temperature thereof and is thereafter exposed to said heat exchange medium having a continuously increasing temperature until said fluid flows from said fluid outlet.

4,398,398
ACOUSTICAL HEAT PUMPING ENGINE

John C. Wheatley; Gregory W. Swift, both of Los Alamos, and Albert Migliori, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 14, 1981, Ser. No. 292,979
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—467 R 10 Claims

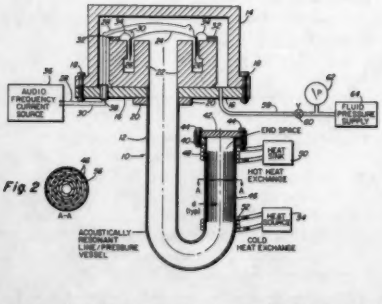


Fig 2

1. An acoustical heat pumping engine having no moving seals comprising:

a housing essentially resonant at a selected frequency having first and second ends;

means for capping said first end of said housing;

a compressible fluid capable of supporting an acoustical standing wave disposed within said housing;

means for providing a selected pressure to said fluid within said housing;

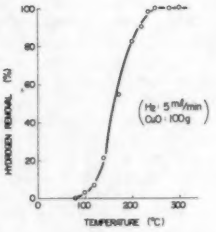
means disposed at said second end of said housing for cyclically driving said fluid with an acoustical standing wave substantially at said selected frequency; and

a second thermodynamic medium disposed within said housing near to but spaced from said capping means, whereby energy continually flows toward said capping means when said engine operates.

4,398,399
HERMETICALLY CIRCULATING, ABSORPTION TYPE REFRIGERATOR

Masahiko Itoh, Hitachiota; Heihatiro Midorikawa; Akira Minato, both of Hitachi, and Kenji Machizawa, Chiyodamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,181
Claims priority, application Japan, Dec. 22, 1980, 55-180436; Mar. 18, 1981, 56-37946
Int. Cl.³ F25B *43/04*
U.S. Cl. 62—475 8 Claims



1. In a hermetically circulating, absorption type refrigerator based on a closed circulation system of constituent members comprised of a successive communication of a regenerator, a condenser, an evaporator, an absorber and a heat exchanger, refrigeration being produced by repetitions of concentration, refrigerant dilution, and heat exchange of an aqueous concentrated lithium bromide solution sealed in the circulation system, the improvement which comprises as evacuation tank for evacuating a hydrogen gas generated in the refrigerator, the evacuation tank being connected to the condenser through a conduit, and a reactor for converting the hydrogen gas to water, the reactor being provided with an oxygen supply source and provided in the conduit between the evacuation tank and the condenser.

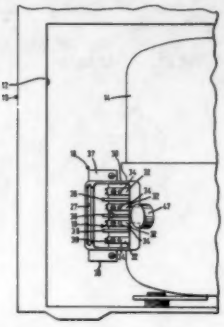
4,398,400
TERMINAL BOARD AND RELAYS CASING ASSEMBLY IN MOTOR COMPRESSORS FOR REFRIGERATORS

Alfredo Bar, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Oct. 29, 1981, Ser. No. 316,356
Claims priority, application Italy, Nov. 3, 1980, 42920 A/80
Int. Cl.³ H02K *11/00*; F25B *39/04*
U.S. Cl. 62—508 1 Claim

1. Terminal board and relays casing box and removable cover for sealed motor compressors forming an assembly positionable sideways on the outer surface of the motor compressor housing, said box defining four side walls, a base and an outer opening, said base being closed by the housing and said outer opening being closed by said removable cover, three of said four sides of said box defining guides into which slide sides of said cover, the fourth of said sides defining pins extending horizontally from said side and spaced vertically from each other and tongues extending horizontally from said side and

positioned between said pins to which pins are positioned connecting links, said cover defining a recess portion to en-



close the terminal board directly arranged on the outer surface of the said motor compressor housing.

4,398,401

STRAIGHT KNITTING MACHINE

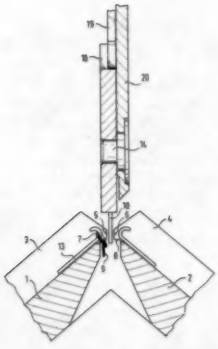
Reinhold Schimko, Aalen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,570

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013145

Int. Cl.³ D04B 7/04

U.S. Cl. 66—64 7 Claims



1. In a straight knitting machine of the type having a pair of needle beds and knocking-over combs arranged in an inverted V-shaped configuration and means carried by the sliding carriage for displacing rows of stitches beneath a needle crossover zone, the improvement comprising:

stop means formed by horizontal edges on said knocking-over combs located beneath vertical knocking-over edges on said combs for limiting the upward movement of the formed rows of stiches,

stripping means and hold down means for the preceding row of stitches carried by said carriage in advance of the knitting zone, and

layering means for newly formed stitches carried by said carriage behind the knitting zone in the direction of travel of the carriage.

4,398,402

KNITTING METHOD AND KNITTED GARMENT

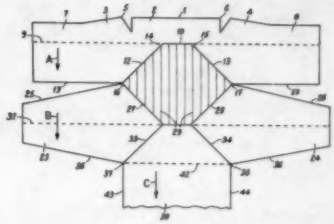
Frank Robinson, and Nigel S. Whatmough, both of Breaston, England, assignors to Courtaulds Limited, London, England

Filed Mar. 10, 1981, Ser. No. 242,327

Claims priority, application United Kingdom, Mar. 13, 1980, 8008639

Int. Cl.³ A41B 9/06

U.S. Cl. 66—176 3 Claims



1. A method of knitting a blank for a garment comprises the following steps carried out in a sequence involving knitting from one waist line to the other in the blank:

(a) knitting two front panels for the garment body with courses extending lengthwise of each front body panel and wales extending in the direction across each front body panel, in the finished garment;

(b) knitting two sleeve panels for the garment with courses extending lengthwise of each sleeve panel; and

(c) knitting a single rear panel for the garment body with courses extending across the rear panel and wales extending lengthwise of the rear panel; and

(d) during knitting forming a join between each front panel and an associated sleeve panel by a process involving the procedures of taking needles out of action whilst holding knitted loops on those needles, and then reintroducing the inactive needles to knitting action, at least one of said procedures being carried out progressively so that a suture join is produced; and

(e) further during knitting forming a join between the rear panel and each sleeve panel by forming knitted wales which extend from the sleeve panels into the rear panel.

4,398,403

COMPACT, PORTABLE LOCKING MECHANISM

Douglas B. Menick, 17830 Sherman Way, #266, Reseda, Calif. 91335

Filed Oct. 30, 1981, Ser. No. 316,887

Int. Cl.³ E05B 73/00

U.S. Cl. 70—58 10 Claims

1. A compact, portable locking mechanism comprising:

a housing having an internal chamber, said housing having a substantially open peripheral edge;

a side wall assembly capable of being located in a position substantially defining an enclosed area, said side wall assembly comprising a fixed portion and a movable portion, one end of said fixed portion being pivotally connected by first pivot means to said housing, said movable portion being pivotally connected by second pivot means to the free end of said fixed portion, said side wall assem-

bly capable of being located in alignment with said peripheral edge defining a closed position totally enclosing said internal chamber, said side wall assembly capable of being pivoted about said first pivot means to an open position providing access through said peripheral edge into said internal chamber; and

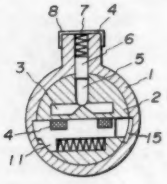
locking means for connecting said movable portion and said housing when said side wall assembly is in said open position forming a first enclosing locking area in between said housing and said fixed portion of said side wall assembly.

4,398,404

KEY DISENGAGEMENT PREVENTIVE DEVICE FOR MAGNETIC TUMBLER CYLINDER LOCKS

Kiyoyasu Wake, Yokohama, Japan, assignor to Miwa Rokku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 22, 1980, Ser. No. 218,515
Claims priority, application Japan, Mar. 10, 1980, 55/29135
Int. Cl.³ E05B *27/06, 47/00*
U.S. Cl. 70—276 **5 Claims**



1. A magnetic tumbler lock mechanism having an outer cylinder and an inner cylinder rotatably about an axis of rotation said mechanism comprising:

a key receiving recess, rectangular in cross section formed in said inner cylinder and adapted to receive a flat key having key magnets therein and a spline means projecting from one flat surface thereof for keying engagement with axially moveable pin means;

a tumbler groove positioned non-axially in said outer cylinder to receive a tumbler magnet movable into locking engagement with said groove;

a non-axially positioned tumbler magnet means mounted in said inner cylinder and adapted to move parallel to and across the face of said key from a first locked position to a second disengaged position upon insertion of said key into said key receiving recess;

a key disengagement preventive device comprising an upper pin segment and a lower pin segment mounted in a pin hole extending through said inner cylinder and said outer cylinder; and,

spacer means positioned within said tumbler groove preventing travel of said lower pin segment into said tumbler groove;

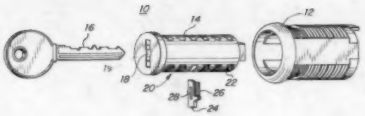
whereby engagement of said key into a key hole moves said upper and lower pin segments outwardly so that a border surface between the upper pin segment and the lower pin segment is aligned with a shear line permitting relative rotation of said inner cylinder with respect to said outer cylinder and preventing removal of said key except upon re-alignment of said pin segments.

4,398,405

LOCK WITH KEY-CONTROLLED REMOVABLE AND INSTALLABLE PLUG AND KEY FOR SAME

George P. Patriquin, Gardner, Mass., assignor to Product Concepts, Inc., Middlebury, Conn.

Filed Mar. 30, 1981, Ser. No. 249,165
Int. Cl.³ E05B *29/04*
U.S. Cl. 70—369 **22 Claims**



1. A lock having a key-controlled removable and installable plug comprising:

a plug including a set of combinating tumblers and a control tumbler including a retaining end and a second end, in a first state said retaining end being extended and said second end being retracted relative to said plug, in a second state said retaining end being retracted and said second end being extended relative to said plug; means for biasing said control tumbler to one of said states, said control tumbler including means for engaging with a key to drive said control tumbler to the other state; and

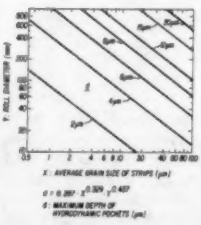
a shell for rotatably receiving said plug and having a peripheral groove for receiving said retaining end of said control tumbler in said first state and preventing longitudinal withdrawal of, while permitting rotation of, said plug in said shell, and a longitudinal groove for accommodating extension of said second end in said second state and enabling withdrawal and installation of said plug when said second end is aligned with said longitudinal groove.

4,398,406

METHOD FOR PRODUCING COLD ROLLED TITANIUM STRIPS

Masahito Fukuda; Akiyoshi Tanabe, both of Kobe; Yasuo Moriguchi, Nishinomiya; Nobuyuki Nagai, Kobe; Kunio Tsuji, Kobe; Yoshihiro Yamaguchi, Kobe; Tomiharu Matsushita, Nishinomiya, and Atsuo Mizuta, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 18, 1981, Ser. No. 264,405
Claims priority, application Japan, May 23, 1980, 55-69174
Int. Cl.³ B21B *3/00, 27/10, 45/02*
U.S. Cl. 72—42 **5 Claims**



1. A method for producing a cold-rolled titanium strip, comprising:

predetermining the average grain size in micrometers of a pre-cold-rolled titanium strip, and

cold-rolling said pre-cold-rolled titanium strip under the condition such that

$$X \leqq 48673/y1.3283$$

wherein X is the average grain size in micrometers of the pre-cold-rolled titanium strip, and

Y is the diameter in millimeters of the rolls used for cold-rolling.

4,398,407

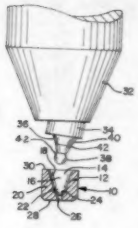
SIZING OF POWDER METAL PARTS

Paul T. DeFay, Jr., Aurora, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jan. 26, 1981, Ser. No. 228,300

Int. Cl.³ B21B *3/06*; B21D *1/02, 3/02*

U.S. Cl. 72—75 **3 Claims**



1. A method of sizing a generally spherical surface formed in the base of a cavity having raised areas provided in a powder metal part, said method comprising

(a) applying a deforming pressure against the base of said cavity with a member having a substantially spherical surface, and

(b) uninterruptedly rotating said member in a series of overlapping and different substantially elliptical orbital paths to cause deformation of said raised areas in said cavity spherical surface and displacement of raised portions of metal into depressions until said cavity base is smooth.

4,398,408

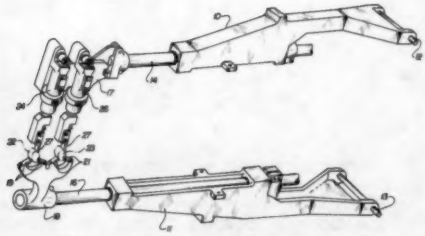
FORGING MACHINE TRANSFER

Robert E. Wisebaker, and Gaylen O. Kline, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Filed Apr. 27, 1981, Ser. No. 257,725

Int. Cl.³ B21J *13/10*

U.S. Cl. 72—422 **7 Claims**



1. A transfer gripper for forging machines or the like comprising a housing, an elongated gripper support having a generally cylindrical portion extending into said housing, bearings supporting said gripper support for longitudinal movement relative to said housing, guide means preventing longitudinal rotation therebetween, spring means urging said gripper support longitudinally in one direction and resisting movement in the opposite direction, a first gripper mounted on said gripper support, a second opposed gripper, said housing being movable in a first direction toward said second opposed gripper and in an opposite direction away therefrom, said first gripper operating in cooperation with said second gripper to grip a workpiece with a force provided by said spring means for transferring said workpiece from a first location to a second location in response to movement of said housing in said first direction and to release said workpiece in response to movement of said housing in said opposite direction, said housing enclosing said bearing means and said spring means to prevent scale or the like from interfering with the operation thereof.

4,398,409

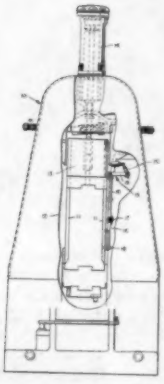
FRICTION SHOCK ASSEMBLY FOR A FORGING HAMMER

Robert D. Hambrick, Havana, Ill., assignor to National-Standard Company, Niles, Mich.

Filed Feb. 23, 1981, Ser. No. 237,497

Int. Cl.³ B21J *9/12*

U.S. Cl. 72—453.01 **10 Claims**



1. A friction shock absorber assembly for use in a forging hammer having a pneumatic powered ram engageable with a shifting valve mechanism having an oscillating rotary shaft for reversing the direction of the ram, the improvement including a friction shock absorber assembly comprised of a plurality of friction members having mating friction surfaces adapted to be mounted and in contact with one another on the oscillating shaft, and wherein the friction members of the friction shock absorber assembly are free of enclosure and maintain a shape under working pressures without the need for an enclosure to prevent distortion of the friction material of said friction members.

4,398,410

AUTOMOTIVE FRAME AND BODY CORRECTING EQUIPMENT

Fred A. McWhorter, Davenport, and Samuel R. Harmon, Clinton, both of Iowa, assignors to Bee Line Company, Bettendorf, Iowa

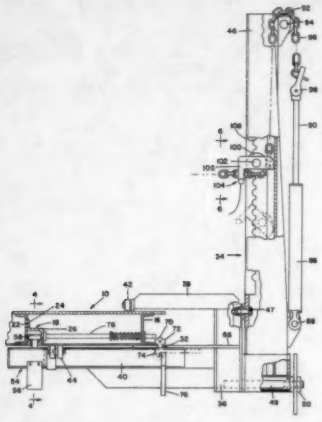
Filed Jul. 17, 1981, Ser. No. 284,161

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—457 **7 Claims**

1. Automotive frame and body correcting equipment comprising: a generally horizontal bed having upper and lower surface portions and a rectilinear perimeter providing four straight sides and four substantially square corners; a correcting accessory having a base of generally U-form including an upper leg extending inwardly over the bed upper surface portion, a lower leg extending inwardly under the bed lower surface portion and a bight joining the legs together outwardly of the bed perimeter; means supporting the base on at least one of its legs for horizontal movement of the base relative to the bed; means at one of the surface portions providing a continu-

ous rectilinear track spaced relatively closely inwardly of the bed perimeter and including four straight paths and four substantially square corners; at least one of the straight track paths having a straight track extension beyond a track corner at which said one straight path meets its neighboring straight track path; track follower means engaging the track for movement along and about the track and selectively into and out of



said track extension; means interconnecting the track follower means and one of the accessory legs for causing the accessory to follow the follower means about the track, said interconnecting means including a pair of interengaged members connected respectively to the one leg and to the track follower means for movement relative to each other lengthwise of said one leg to enable variations in the horizontal distance between the track follower means and the accessory bight.

4,398,411

VIBRATION DAMPED RIVET BUCKING TOOL

Wolfgang Emmerich, Munkhagen, Finland, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sep. 30, 1981, Ser. No. 307,304
Claims priority, application Sweden, Oct. 1, 1980, 8006874
Int. Cl.³ B21J *15/40*
U.S. Cl. 72—482 **12 Claims**

1. A vibration damped rivet bucking tool comprising:

a housing subjectable to a manual bucking force said housing having an opening at one end thereof;

a cylinder bore in said housing;

a single piston reciprocably disposed within said cylinder bore;

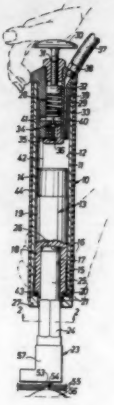
a resilient biasing means disposed in said cylinder bore and acting on said piston in a direction towards said housing opening to transfer said bucking force from said housing to said piston;

a rivet bucking die connected to said piston and being applicable against a rivet to be bucked;

a shank on said die, said die shank having an impacting end face;

an elongated tubular skirt integrally formed on said single piston, said skirt being shorter than said die shank and defining a socket on said piston in communication with said opening in said housing for removably receiving said die shank therein via said opening with said end face of said die shank interior of said socket; and

a transverse anvil surface on said single piston, said transverse anvil surface terminating and forming the bottom of



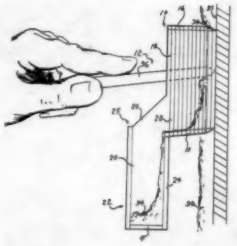
said socket interior of said single piston for impact receiving cooperation with said end face of said die shank.

4,398,412

DEVICE FOR DETERMINING FROST DEPTH AND DENSITY

Farouk Huneidi, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,626
Int. Cl.³ G01N *9/00*
U.S. Cl. 73—32 R **7 Claims**



1. A device for determining the density and depth of frost on a surface, comprising:

a unitary body having a forward open window portion adapted to be placed against the frost surface and adapted to have downward pressure applied thereto so as to cause it to sink readily to the underlying supporting surface whereby the frost will occupy the open space within the window;

said unitary body having a rear container portion with a lower plate secured at a front end thereof to an upper edge of a rear part of the window portion;

said rear container portion having a front entry opening above the lower plate of said rear container portion and rearward of the upper edge of said window portion for receiving the frost scraped from the open window;

calibrated lines along a side of the open window portion to enable an observer to note the depth of the frost;

calibrated lines along a side of the container portion to enable an observer to note the height of the water therein, water resulting only from the melting of said frost therein scraped from the window portion; and

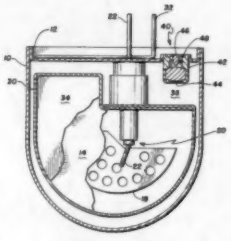
a graph on another side of the rear container portion to enable an observer to correlate the depth of the frost and the height of the water noted to the density of the frost.

4,398,413

LEAK DETECTION FOR HERMETIC ENCLOSURES

T. V. Rao, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed May 18, 1981, Ser. No. 264,790
Int. Cl.³ G01M *3/20*
U.S. Cl. 73—40.7 **3 Claims**



1. A method for detecting leaks in a sealed enclosure, comprising the steps: providing self-sealing septum means communicating with the enclosure interior;

penetrating the septum means with hypodermic-like needle means;

evacuating the enclosure interior through the needle means;

introducing an inert gas to the enclosure interior through the needle means;

withdrawing the needle means from the septum whereby it self-seals;

placing the sealed enclosure in an evacuated test fixture in communication with means for detecting the gas; and

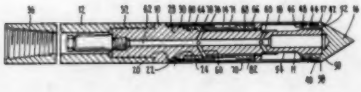
testing for the presence of gas escaping from the sealed enclosure.

4,398,414

ELECTRICAL FRICTION SLEEVE CONE PENETROMETER

John S. MacGregor, Townhouse 5, 76 Molesworth St., Kew, Australia

Continuation-in-part of Ser. No. 92,263, Nov. 8, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 285,471
Int. Cl.³ G01N *3/00*
U.S. Cl. 73—84 **11 Claims**



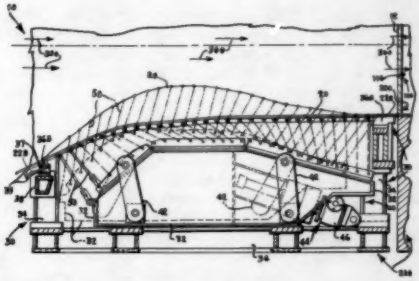
1. A quasi-static electrical friction-sleeve cone penetrometer comprising; a generally cylindrical probe including a main body, a first load cell integral with said body and having a longitudinal axis, an independent second load cell connected to said body, said first load cell and said second load cell being axially spaced along said longitudinal axis, a cone connected to said first load cell, and a friction sleeve connected to said second load cell, said friction sleeve having an inwardly extending portion intermediate of the length thereof forming a sliding support for said sleeve on said main body between said first load cell and said second load cell, first electrical means associated with said first load cell for conversion of first load cell distortion as a result of cone resistance into electrical signals, and second electrical means associated with said second load cell for conversion of second load cell distortion as a result of side friction on said friction sleeve into electrical signals to provide a continuous and separate measurement of each quantity.

4,398,415

SWING LINK FLEXIBLE WIND TUNNEL NOZZLE

James L. Jacocks, Tullahoma, and Henry L. Henderson, Winchester, both of Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 10, 1981, Ser. No. 329,443
Int. Cl.³ G01M *9/00*
U.S. Cl. 73—147 **6 Claims**



1. A flexible duct for conveying a gaseous flow, comprising:

a. means having a changeable contour for defining a wall of said duct; and

b. means, operably connected to said wall defining means for changing said contour of said wall defining means wherein this means includes: a cradle-like member connected to said wall defining means, said cradle-like member being capable of translatable and rotatable movement; and, means for applying a load to said cradle-like member in order to cause said movement of said cradle-like member to take place thereby changing said contour of said wall of said duct.

4,398,416

DETERMINATION OF FRACTURING FLUID LOSS RATE FROM PRESSURE DECLINE CURVE

Kenneth G. Nolte, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 71,953, Aug. 31, 1979, abandoned. This application Aug. 6, 1981, Ser. No. 290,635
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—155 **6 Claims**

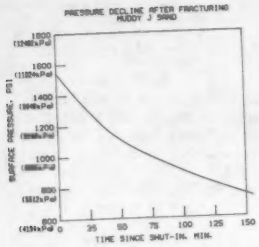
1. A method of determining the rate of fracturing fluid loss during a primary hydraulic fracturing treatment of a subterranean formation, which comprises:

measuring the pressure of the fluid in a fracture after a calibration fracturing treatment in said formation has been terminated and during the closure of said fracture wherein said fracture is shut-in such that substantial volumes of said fracturing fluid do not flow from said fracture into said wellbore and said pressure declines after the termination of said fracturing treatment and wherein the fluid in such calibration treatment has similar properties to the fluid to be used in said primary treatment,

selecting a period of time during the closure of said fracture while the loss of fluid from said fracture to the formation

adjacent to the fracture is the primary factor contributing to said pressure decline,

determining the fluid loss characteristics of the fracturing fluid from the rate of pressure decline during said selected period, and



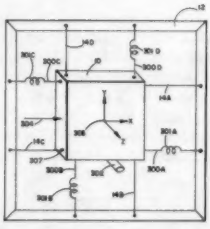
calculating the rate of fracturing fluid loss from the fracture during the primary fracturing treatment on the basis that the fracturing fluid used in said primary treatment will have the same fluid loss characteristics as the fracturing fluid used in the calibration treatment.

4,398,417

THREE-AXIS ACCELEROMETER HAVING FLEXURE BEARING WITH OVERLOAD PROTECTION

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,543
Int. Cl.³ G01P *15/02*
U.S. Cl. 73—514 **6 Claims**



1. An instrument, comprising:

a base member;

a suspended member;

elastic suspension means for maintaining the position of said suspended member relative to said base member, wherein said elastic suspension means is relatively compliant in three degrees of freedom and relatively stiff in the remaining three degrees of freedom at loads on said elastic suspension means within a selected design load; and

a mechanical stop disposed on said base sufficiently displaced from the null position of said suspended member to avoid interference between said mechanical stop and said suspended member at loads on said elastic suspension means within the selected design load;

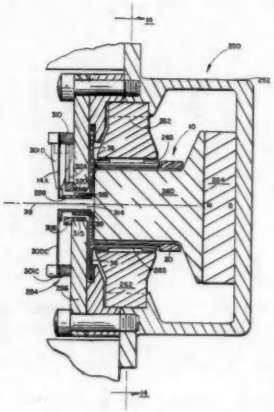
wherein said elastic suspension means has sufficient compliance in all six degrees of freedom at loads on said elastic suspension means in excess of said selected design load to permit said suspended member to reach said mechanical stop for support without causing structural breakdown or significant bias shift in said elastic suspension means.

4,398,418

THREE-AXIS ACCELEROMETER HAVING IMPROVED MAGNET CONFIGURATION

Sidney G. Shutt, Brea; Adrian K. Dorsman, Bellflower, and Doyle E. Wilcox, Hacienda Heights, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,544
Int. Cl.³ G01P *15/13*
U.S. Cl. 73—517 B **7 Claims**



1. An accelerometer, comprising:

(a) a base;

(b) a proof mass; and

(c) electromagnetic means for constraining displacement of said proof mass relative to said base in three degrees of freedom, wherein said electromagnetic means comprises:

(1) means for establishing a magnetic field consisting of a single regularly shaped and uniformly magnetized source of magnetizing force; and

(2) a plurality of coils for carrying electrical current mounted in said magnetic field, wherein said plurality of coils comprises three sets of said coils, each set associated with a distinct one of the three orthogonal axes of a Cartesian coordinate system fixed to said proof mass, and wherein electrical excitation of a selected coil set applies a force to said proof mass along the axis of said coordinate system associated with said selected coil set;

(3) wherein said three sets of coils comprises:

(i) a first set of coils disposed to apply a force to said proof mass along a first cross axis of said proof mass;

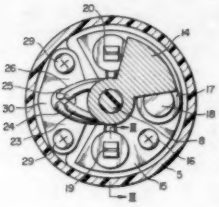
(ii) a second set of coils disposed to apply a force to said proof mass along a second cross axis of said proof mass, wherein said second cross axis is orthogonal to said first cross axis; and

(iii) a third set of coils disposed to apply a force to said proof mass along a longitudinal axis of said proof mass, wherein said longitudinal axis is orthogonal to said first and second cross axes, wherein said third set of coils comprises a helical coil wound circumferentially about said proof mass.

4,398,419
ROTATIONAL ANGLE SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Aichi, Japan

Continuation of Ser. No. 182,663, Aug. 29, 1980, abandoned.
This application Apr. 26, 1982, Ser. No. 371,971
Int. Cl.³ G01B 7/30
U.S. Cl. 73—518 12 Claims



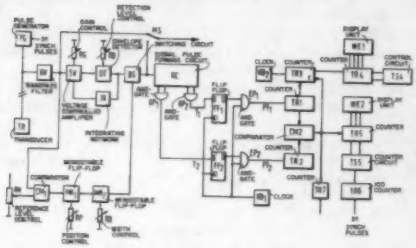
1. A rotational angle sensor device, comprising:
a casing;
rotatable shaft means rotatably supported by said casing, the angular position of said rotatable shaft means being responsive to an angular displacement of an external object;
permanent magnet means firmly mounted inside said casing for providing a magnetic field;
at least one core means disposed adjacent to said permanent magnet means, said at least one core means being firmly mounted inside said casing, said at least one core means including a thin sheet of magnetically soft material;
electrical coil means including at least one coil wound about said at least one core means;
a ferromagnetic member secured to said rotatable shaft means and movable therewith, said ferromagnetic member being capable of angular movement in a spaced relationship with respect to said at least one core means and to said permanent magnetic means;
means for applying an electrical signal to a first terminal of said coil to saturate said core means magnetically; and
means for producing an angular position output signal indicative of the rotation of said rotatable shaft means based on the amount of time between application of said electrical signal and saturation of said core means.

4,398,420
SYSTEM FOR MEASURING THE WALL THICKNESS OF AN OBJECT

Wilhelmus M. J. Haesen, Dordrecht, and Gerardus M. Keltjens, Grondveld, both of Netherlands, assignors to B.V. Neratoom, The Hague, Netherlands

Filed May 15, 1981, Ser. No. 263,892
Claims priority, application Netherlands, May 19, 1980, 8002888
Int. Cl.³ G01N 29/00
U.S. Cl. 73—597 8 Claims

1. Apparatus for measuring wall thickness of an object by ultrasonic energy, the apparatus including a transducer for transmitting ultrasonic energy into a front wall of an object and receiving echo signals from the object, a transceiver coupled to the transducer for energizing the transducer to transmit periodic pulses of ultrasonic energy and for processing the echo signals received by the transducer to derive a signal indicative of the wall thickness of the object from a time interval between received echo signals, wherein the improvement comprises:
a discriminator circuit adapted to select a set of three successive echo signals as caued by reflections from a rear wall of the object from among a group of received echo signals received in response to each transmitted pulse of ultrasonic energy;
a converter circuit coupled to the discriminator circuit for converting the time intervals between each set of three successive echo signals into a first pulse train indicative of the time interval between the first and second echo signal of the set and a second pulse train indicative of the time interval between the second and third echo signal of the set, said converter circuit including level control circuitry adapted to maintain the relative detection point of each echo signal of each set substantially the same;

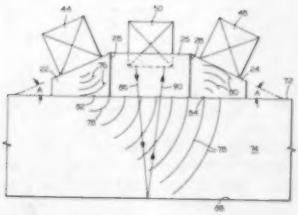


a comparator coupled to the output of the converter circuit for comparing each first pulse train with the corresponding second pulse train; and
a processor circuit for producing a signal which effectively contributes to a measuring result representative of the wall thickness of the object only when the respective first and second pulse trains are substantially matched to each other.

4,398,421
ULTRASONIC THICKNESS MEASURING APPARATUS AND METHOD

Dennis A. White, Stafford Springs, Conn., assignor to Hartford Steam Boiler Inspection and Insurance Company, Hartford, Conn.

Filed Dec. 23, 1981, Ser. No. 333,923
Int. Cl.³ G01N 29/00
U.S. Cl. 73—597 35 Claims



1. An ultrasonic method for measuring the thickness between opposed surfaces of a workpiece from one surface thereof comprising
(a) measuring a velocity parameter of ultrasonic longitudinal waves through the material of the workpiece at a location along a first surface of a workpiece by
(i) providing a pair of transducer assemblies on said first surface at points spaced apart a predetermined distance;
(ii) transmitting ultrasonic waves from one transducer assembly into said first surface at an angle of incidence thereto producing subsurface longitudinal waves;
(iii) receiving in said second transducer assembly said subsurface longitudinal waves exiting said first surface as substantially the same angle;
(iv) acoustically insulating said pair of transducer assem-

blies from transmission of ultrasonic waves directly therebetween; and

(v) determining a velocity parameter of said longitudinal waves so transmitted and received,

(b) transmitting ultrasonic longitudinal waves from said first subsurface to the opposite surface of said workpiece,

(c) receiving the ultrasonic wave reflected from said opposite surface, said transmitting of ultrasonic waves to, and receiving the reflected ultrasonic waves from, the opposite surface being conducted by operation of a third transducer assembly,

all of said transducer assemblies being provided wherein the sound transducer assemblies are insulated from transmission of ultrasonic waves directly therebetween;

(d) measuring a time parameter between transmission of said longitudinal waves and reception of said reflected waves; and

(e) determining the thickness between said first and opposite surfaces from the measured velocity parameter and the measured time parameter.

4,398,422

ULTRASONIC-IMAGE DEVICE

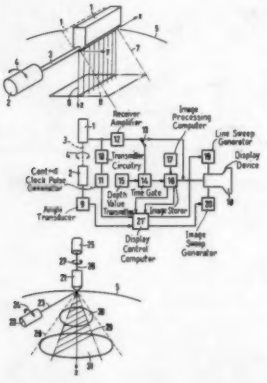
Rainer Haerten, Roettenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 11, 1981, Ser. No. 242,714

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012173

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—626 **17 Claims**



1. An ultrasonic imaging system comprising an ultrasonic applicator for ultrasonic scanning of a layer of an examination object, and a display device for providing an echo image display,

(a) first scanning means for operating said applicator to effect scanning in a line-by-line fashion with an ultrasonic beam directed generally in a depth direction so as to sweep a scanning plane (6, 7; 29), and

(b) second scanning means mounting said applicator for angular movement about an axis (3; 26) so as to successively offset the scanning plane angularly and to sweep a scanning volume within an examination object, said second scanning means comprising a mechanical drive (2; 25) coupled with said applicator for effecting the angular movement thereof about said axis,

(c) said ultrasonic applicator comprising a longitudinally extended ultrasonic array (1), said first scanning means (10) serving to operate said ultrasonic array (1) by sequential electronic beam switching so as to offset the ultrasonic beam in a longitudinal direction in sweeping the scanning plane (6, 7), and said second scanning means mounting said ultrasonic array (1) for oscillatory movement about a pivot axis (3) which extends in the longitudinal direction of said ultrasonic array (1),

(d) said mechanical drive comprising an oscillatory drive motor (2) for effecting the oscillatory movement of the ultrasonic array (1) about said pivot axis (3), through successive angular positions, said pivot axis (3) remaining at a fixed spacing relative to the examination object at a given application location,

(e) operating means coupled with said ultrasonic applicator for operating the ultrasonic applicator for scanning over a layer conforming with a surface different from said scanning plane and extending through the scanning volume, and an image storer (16) for storing echo signals, said operating means including a time gate circuit (14, 15), and means operable in one mode to supply the echo signals to the image storer (16) under the control of the time gate circuit (14, 15).

4,398,423

ULTRASONIC SIGNAL PROCESSING APPARATUS

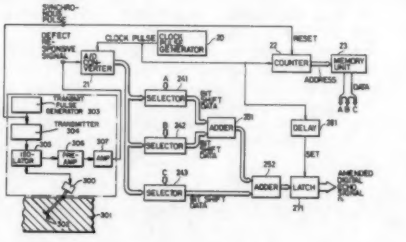
Fuminobu Takahashi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1981, Ser. No. 224,117

Claims priority, application Japan, Jan. 11, 1980, 55-1306

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—631 **5 Claims**



1. An ultrasonic signal processing apparatus comprising:

transducer means for transmitting an ultrasonic pulse beam into a workpiece and for receiving an echo signal reflected from a defect in said workpiece;

an analog-to-digital converter for converting into a digital signal an amplitude value of said echo signal received by said transducer means;

a memory unit which stores therein amplitude compensation procedure data for said echo signal to be amended in correspondence with lapsed times after said ultrasonic pulse beam has been transmitted from said transducer means;

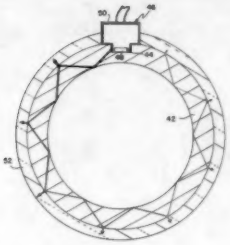
amplitude compensation procedure data-readout means for reading out the amplitude compensation procedure data from said memory unit by supplying said memory unit with a signal corresponding to the lapsed time; and

amended amplitude-output means for amending the amplitude of said echo signal from said analog-to-digital converter by multiplying said digital signal by a value designated by the compensation procedure data read out from said memory unit.

4,398,424
ULTRASONIC SENSING

Leigh R. Abts, Providence, R.I., assignor to Micro Pure Systems, Inc., Smithfield, R.I.

Filed Dec. 16, 1980, Ser. No. 217,088
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—632 **8 Claims**



1. A pulse-echo device which uses low intensity signals for obtaining information about very small particulates in a fluid flowing through a pipe comprising:

a transducer for producing low intensity energy waves,

said transducer in order to reduce energy wave losses so as to enable the small particulates to be detected being in direct acoustical contact with the pipe which is comprised of a sound-transmitting material,

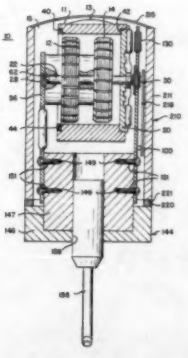
a sound-absorbing layer coating said pipe material,

said layer being sound-impedance matched to said pipe material so that most of any spurious sound waves travelling in said pipe material pass into said layer where they dissipate.

4,398,425
ULTRASONIC SCANNING TRANSDUCER

Terrance Matzuk, Pittsburgh, Pa., assignor to Dymax Corporation, Pittsburgh, Pa.

Filed Aug. 3, 1981, Ser. No. 289,312
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—633 **31 Claims**



1. Ultrasonic scanning apparatus adapted for use in an ultrasonic scanning system that examines an object by directing a timed series of ultrasonic waves into the object and provides to the scanning system information carried by the returning ultrasonic echoes generated when the waves strike acoustical interfaces within the object comprising:

a housing containing matter through which the ultrasonic waves and echoes can travel;

means disposed within said housing for creating ultrasonic waves from electrical energy;

means disposed within said housing for creating information carrying electrical energy from ultrasonic waves;

a permanent magnet disposed within said housing and mounted therein for rotational movement for supporting at least one of said ultrasonic wave creating means and said electrical energy creating means;

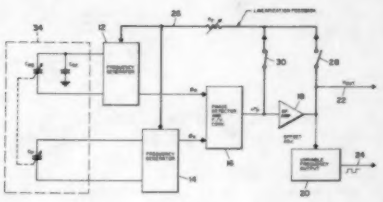
bearing means for mounting said permanent magnet for said rotational movement; and

means secured within said housing for receiving a periodic electrical signal having a zero average value and creating, in response thereto, a unidirectionally rotating primary magnetic field capable of exerting a force on said permanent magnet and thereby rotating said permanent magnet in the direction of rotation of said primary magnetic field.

4,398,426
LINEAR CAPACITIVE PRESSURE TRANSDUCER SYSTEM

Kyong Park, Chatsworth, Calif., and Chen Y. Lee, Troy, Mich., assignors to Kavlico Corporation, Chatsworth, Calif.

Filed Jul. 2, 1981, Ser. No. 279,938
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—724 **10 Claims**



1. A linearized capacitive pressure transducer system comprising:

a main variable capacitor which has a capacitance which varies with applied pressure;

a reference capacitor which has a relatively constant capacitance;

circuit means associated with said variable capacitor for charging said variable capacitor with a predetermined current to a predetermined reference voltage level, and for providing a first timing signal when the predetermined reference voltage level is reached;

circuit means associated with said reference capacitor for charging said reference capacitor with a predetermined current to a predetermined reference voltage level and providing a second timing signal when the predetermined voltage level is reached;

a current source;

switching means for directing current from said current source alternatively to said variable capacitor and to said reference capacitor;

bistable circuit means responsive to said first and second timing signals to change state and to reverse the state of said switching means to change current flow;

detection and integrator circuit means for receiving the pulse output from said bistable circuit means and for converting it into a D.C. electrical signal;

means for amplifying said D.C. electrical signal to provide a system output signal which varies substantially linearly with changes in pressure but which when uncompensated has a substantially continuous curvature producing minor departures from linearity;

feedback means connected from said system output voltage amplifying means to at least one of said circuit means

associated with said capacitors for incrementally varying the time required for charging at least one of said capacitors, to substantially compensate for the curvature of the system output voltage versus pressure characteristic; and

said feedback means including means for changing the charging current to at least one of said capacitors incrementally as said system output voltage changes.

4,398,427

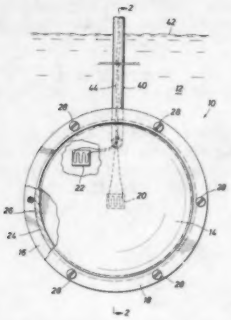
THIN SHELL PRESSURE SENSOR

Robert B. Pan, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jun. 5, 1981, Ser. No. 270,931

Int. Cl.³ G01L *7/08*

U.S. Cl. 73—784 **18 Claims**



1. A thin shell pressure sensor for measuring in situ pressures in a medium in which the sensor is placed, said sensor comprising:

a substantially flat base plate;

a thin shell segment defining a curved surface bounded at a peripheral edge, said curved surface having an apex relatively distal on said curved surface from said peripheral edge, said thin shell segment attached to said base plate along said peripheral edge so as to form an enclosed chamber between said base plate and said thin shell segment, said thin shell segment being elastic and substantially rigid; and

means for sensing membrane stresses in said thin shell segment at a position proximate said apex, said membrane stresses being caused by said in situ pressure of said medium.

4,398,428

FLUID FLOW SENSOR

Yoshiaki Kato, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 7, 1981, Ser. No. 223,090

Claims priority, application Japan, Jan. 10, 1980, 55-901; Feb. 26, 1980, 55-23834

Int. Cl.³ G01F *1/70*

U.S. Cl. 73—861.05 **7 Claims**

1. A fluid flow sensor to measuring fluid velocity and/or amount flowing therethrough, comprising:

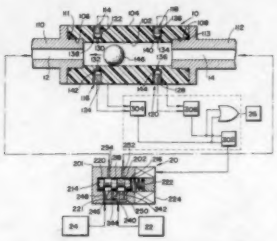
a sensor housing;

a fluid passage formed in said housing with a substantially straight passage portion for containing a fluid operable to flow alternately in first and second directions therethrough;

a ball member movably disposed within said fluid passage;

pairs of photo sensitive sensors respectively provided in said housing, and sealing means to prevent liquid contact of fluid in the passage with the sensors but allowing a light path to project into the passage to sense the ball position, each pair of said photo sensitive sensors being located adjacent opposite ends of said fluid passage, and each sensor pair being responsive to and interrupted by said ball member flowing towards a corresponding end of said fluid passage to produce a sensor signal;

a fluid flow direction switching means for switching flow directions of the fluid between said first and second directions, said fluid flow direction switching means including an actuator variable between a first position causing the fluid to flow in said first direction and a second position in which the fluid flow in said second direction, and a flip-



flop associated with said actuator for varying the position thereof between said first and second positions, said flip-flop being responsive to said sensor signal to vary its position between a set position and a reset position which correspond to first and second positions of said actuator respectively; and

a counter means responsive to occurrence of said sensor signal generated by one of said sensor pairs and thereby to set/reset switching in said flip-flop, velocity and/or amount.

4,398,429

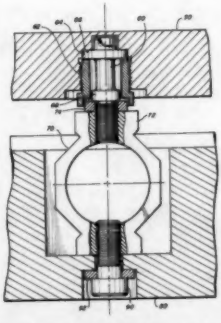
FORCE PLATFORM CONSTRUCTION AND METHOD OF OPERATING SAME

Nathan H. Cook, Cambridge, and Forest J. Carignan, Bedford, both of Mass., assignors to Advanced Mechanical Technology, Inc., Newton, Mass.

Filed May 4, 1981, Ser. No. 260,040

Int. Cl.³ G01L *5/16*

U.S. Cl. 73—862.04 **3 Claims**



1. A force measuring plate apparatus for measuring multi axis force components, said apparatus comprising a bottom plate, a top plate being of a construction such that it is deformable by forces exerted thereagainst, load cell structures for deformably supporting the top plate in spaced relation to the bottom plate, said load cell structures comprising strain ring means having strain gages suitably located to provide for multi axis force measurement thereon and composite anchoring means connected between the top plate and the strain rings of

each of the load cell structures, each of said composite anchoring means including an elastic post member which is arranged to provide for all of the multi axis forces transmitted between the top plate and respective load cell structures passing through the elastic post member, and retaining elements for securing the elastic post members in suitable relationship with respect to the top plate and the strain ring means, and said elastic post members of the cell structures being of a compliance with respect to rotation about a horizontal axis greater than the compliance of respective load cell structures thereby to appreciably eliminate transmission of erroneous internally induced multi axis strain signals resulting from deformation of the top plate.

4,398,430

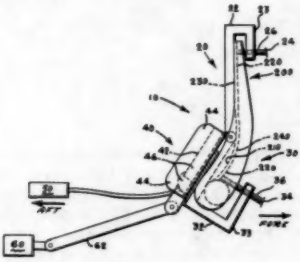
RUDDER PEDAL GRIP ASSEMBLY

Dana R. Hope, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Wasington, D.C.

Filed Feb. 18, 1981, Ser. No. 235,488

Int. Cl.³ G01F *5/22*

U.S. Cl. 73—862.54 **5 Claims**



2. A universal, reusable, grip assembly for non-destructive removable attachment to a rudder pedal of an aircraft/aircraft flight simulator, said rudder grip assembly comprising:

a. a first clamp means for being removably attached to an upper portion of said rudder pedal, wherein said means includes:

a first frame member which overhangs said upper portion of said rudder pedal; and

a first movable means for securing said first frame member to said rudder pedal, wherein this means includes a first clamp screw member threadedly movable in said first frame member and also in securing contact with a rear surface of said rudder pedal, with said first movable securing means operably associated with said first frame member; and

b. a second clamp means for being removably attached to a lower portion of said rudder pedal, wherein this means includes:

a second frame member hingedly connected to said first frame member and disposed in an underslung position relative to said lower portion of said rudder pedal; and

a second movable means for securing said second frame member to said rudder pedal, wherein this means includes a second clamp screw member threadedly movable in said second frame member and also in securing contact with a rear surface of said rudder pedal, with said second movable securing means operably associated with said second frame member;

whereby the rudder pedal of said aircraft/aircraft flight simulator to which said rudder pedal grip is removably attached can be used conventionally to operate said aircraft/aircraft flight simulator without the removal of said rudder pedal grip assembly.

4,398,431

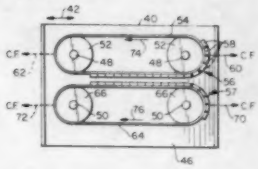
MECHANICAL POWER TRANSMITTING SYSTEM

Harry S. Melnick, 160 Steele Rd., West Hartford, Conn. 06119

Continuation-in-part of Ser. No. 28,501, Apr. 9, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,148

Int. Cl.³ F16H *19/06*; E01C *19/30*; E02D *7/00*

U.S. Cl. 74—61 **31 Claims**



1. A system including a rotatable drive member, a load and a power transmitting device for drivingly connecting said drive member to said load, said device comprising a weight means, a carriage, means connected to said carriage restraining said weight means to movement along a path fixed relative to said carriage and consisting of two substantially parallel segments joined by two substantially semicircular end segments, said weight means being distributed substantially uniformly along a continuous portion of the length of said path, which portion is substantially less than the total length of said path, so that during each traverse of said path by said weight means a first centrifugal force, directed in one direction along the axis joining the centers of said two semicircular end segments, is produced as said weight means passes over the first of said two semicircular segments and a second centrifugal force, directed in the opposite direction along said axis, is produced as said weight means moves over the other of said two semicircular segments of said path, means drivingly connecting said drive member to said weight means to cause said weight means to be driven along said path in response to rotation of said drive member, a frame, means supporting said carriage for reciprocating movement relative to said frame along a given elongated path fixed relative to said frame and which path is at least as long as the radius of one of said semicircular end segments, said path of reciprocating movement being arranged generally in the same direction as said axis so that said carriage is urged to move along said elongated path relative to said frame by said centrifugal forces, a power source, means drivingly connecting said power source to said drive member so as to drivingly rotate said drive member without interfering with the movement of said carriage relative to said frame along said elongated path, and means for drivingly connecting said carriage to said load to cause said load to be driven in response to the reciprocating motion of said carriage, whereby said carriage is enabled to move through strokes of relatively large amplitude and duration.

4,398,432

TRANSMISSION WITH OVERRUNNING CLUTCHES

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

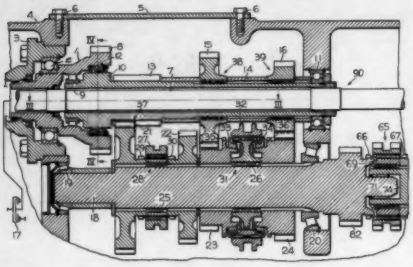
Filed Dec. 22, 1980, Ser. No. 219,264

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—331 **10 Claims**

1. A vehicle transmission comprising; an input shaft, a drive shaft, an overrunning clutch connected between said input shaft and said drive shaft and driving said drive shaft, a countershaft, a plurality of gearsets drivingly connecting said drive shaft with said countershaft, a manual clutching means selectively and alternatively clutching selected ones of said gearsets for driving said countershaft, a jackshaft, at least one gearset drivingly connected between said jackshaft and said drive shaft, a friction clutching means on said jackshaft for engaging drive through said jackshaft to said drive shaft causing said

overrunning clutch to overrun, a second overrunning clutch drivingly connected between said input shaft and said jackshaft and normally overrunning, said second overrunning clutch engaging for a counterdrive from said countershaft through



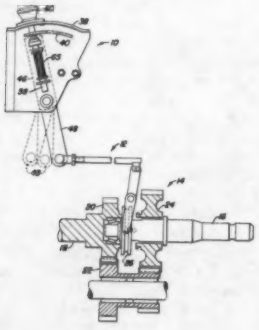
said jackshaft and input shaft for providing engine braking of said vehicle when the vehicle is coasting, said friction clutching means and said overrunning clutches thereby providing shifting during operation of said transmission.

4,398,433

SHIFT LEVER ASSEMBLY

Eugen Sonns, Heddesheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 133,179, Mar. 24, 1980, abandoned.
This application Jul. 13, 1981, Ser. No. 282,637
Claims priority, application United Kingdom, Jul. 5, 1979, 7923520
Int. Cl.³ G05G *5/02, 7/00*
U.S. Cl. 74—475 **12 Claims**



1. A shift lever assembly for changing the speed of a rotatable shaft, comprising:

(a) a first plate containing a slot having at least three pairs of notches formed thereon, two pairs of said notches corresponding to two speed positions and said third pair of notches corresponding to a neutral position which is located between said two speed positions;

(b) a second plate containing a slot with a recess formed thereon corresponding to said neutral position;

(c) a movable rod attached to said rotatable shaft and passing through said slots formed in said first and second plates;

(d) a knob attached to said rod having stop means engageable with said notches of said first plate to position said rod in said speed positions and said neutral position; and

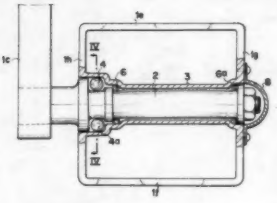
(e) abutment means for preventing said rod from moving directly from one speed position to the next until said rod is rotated while in the neutral position.

4,398,434

FORCE-SAVING HIGH SPEED PEDAL

Senkichiro Kimura, 4-14-23, Shiratori, Katsushika-ku, Tokyo, Japan 125

Continuation of Ser. No. 141,211, Apr. 17, 1980, abandoned.
This application Mar. 12, 1982, Ser. No. 357,666
Claims priority, application Japan, Mar. 12, 1980, 55/30288
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—594.4 **3 Claims**



1. A bicycle pedal of high mechanical advantage comprising a spindle adapted to be connected to a crank, a center tube covering said spindle, inner and outer plates attached to said center tube perpendicularly thereto and inner and outer treads connecting the plates at their outer edges, said treads being parallel to said spindle, said spindle having at least one bearing race, said center tube having a plurality of arcuate grooves on the inner surface thereof, said grooves being in a single plane between said inner and outer plates and said plane being perpendicular to the axis of said center tube, each of said grooves having a ball bearing therein, the depth of the arc of said grooves becoming gradually smaller and narrower than the size of said ball bearing in the clockwise direction from one end of said groove to the other and thereof to form a one-way clutch by said bearings being wedged between said spindle and said arcuate grooves, whereby said pedal is prevented from rotation in the clockwise direction and is freely rotatable in the counter-clockwise direction.

4,398,435

SELF-POSITIONING AND SELF-ADJUSTING PRESS GUARD

William S. VanSice, DuBois; Jonathan L. Sweka, Reynoldsville, and Keith G. Marshall, Luthersburg, all of Pa., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Jun. 10, 1981, Ser. No. 272,403
Int. Cl.³ F16P *1/02, 3/10*
U.S. Cl. 74—612 **10 Claims**

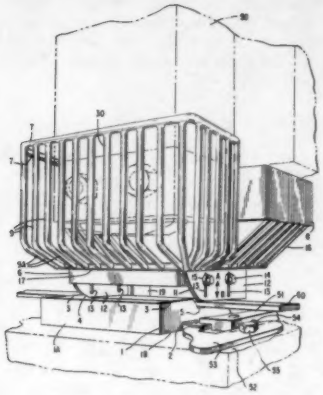
1. A safety device for protecting the operator of a machine, said machine having a work zone and being capable of receiving a work piece, said safety device comprising:

(a) a base having an inclined surface for receiving said work piece and directing said work piece into said work zone;

(b) a barrier for protecting the operator, said barrier being connected to said base; and,

(c) gate means positioned adjacent said inclined surface for

sliding vertically upon contact from said work piece and for maintaining a height above said base corresponding to



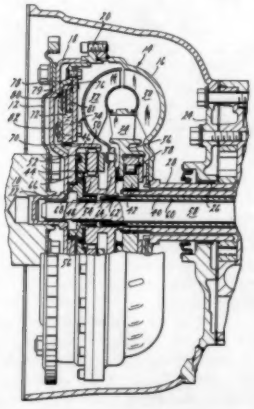
said work piece while said work piece remains in said work zone.

4,398,436

MULTIPLE RATIO TRANSMISSION HAVING A TORQUE SPLITTER INPUT GEAR WITH A POCKETED CARRIER

Alan R. Fisher, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 7, 1980, Ser. No. 137,348
Int. Cl.³ F16H *47/08, 3/44*
U.S. Cl. 74—688 **4 Claims**



1. A hydrokinetic power transmission mechanism comprising multiple ratio gearing and a hydrokinetic torque converter adapted to establish a driving connection between a driving shaft and a driven shaft;

said converter including an impeller connected to said driving shaft, a pair of torque input shafts for said gearing, a turbine connected to one of said torque input shafts;

a torque splitter planetary gear unit located within said converter and including a ring gear and a sun gear and a set of planet pinions, said pinions being rotatably mounted within a torque splitter carrier, said carrier being connected drivably to a second of said torque input shafts, said ring gear having a cylindrical inner periphery with internal teeth thereon;

said converter operating in hydrokinetic fluid that immerses said splitter gear unit;

said carrier having circular pockets defining circular frictional surfaces within which said pinions are positioned so that the addendum circles frictionally engage said frictional surfaces;

said pinions engaging said ring gear and said sun gear, the ring gear being coupled to said impeller and the sun gear being coupled to said turbine; and

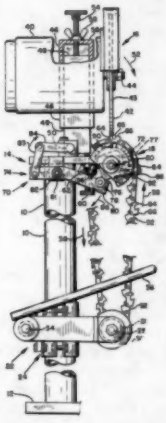
the addendum circles for said pinions being on friction torque surfaces whereby a friction torque flow path through said splitter gear unit bypasses the hydrokinetic torque flow path through said hydrokinetic unit.

4,398,437

SAW CHAIN DEPTH GAUGE GRINDER

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Nov. 3, 1980, Ser. No. 203,793
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—25 A **7 Claims**



1. A saw chain grinder comprising:

support means including a saw chain sprocket for rotatably supporting a length of saw chain for lengthwise movement to enable movement of successive depth gauges of said chain through a grinding position;

grinding means for grinding the outer ends of said depth gauges while supported in said grinding position;

positioning means for positioning said grinding means in a first predetermined position spaced from said support means for grinding said depth gauges to a uniform height, said grinding means being movable to a second position spaced from the saw chain;

a camming means including a rotational cam rotably connected to the saw chain sprocket in a fixed angular relationship synchronized with the depth gauges of said saw chain; and

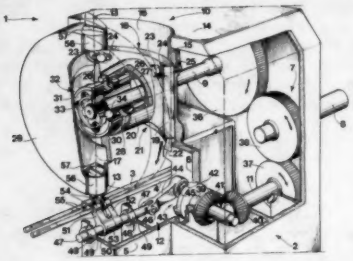
linkage means interconnecting the camming means and the grinding means;

the camming means being operative, when a depth gauge is in said grinding position, to move said grinding means between said first position and said second position upon movement of the depth gauge longitudinally away from the grinding position.

4,398,438
DEVICE FOR SIMULTANEOUSLY CUTTING TWO CONTINUOUS RODS OF CIGARETTE

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa' per Azioni, Bologna, Italy

Filed Oct. 5, 1981, Ser. No. 308,669
Claims priority, application Italy, Dec. 12, 1980, 50352 A/80
Int. Cl.[3] A24C 5/28; B26D 1/56, 3/16
U.S. Cl. 83—310 5 Claims



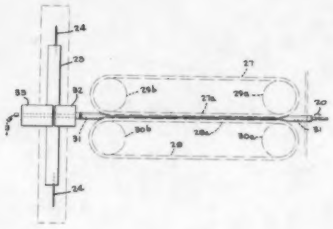
1. A device for simultaneously cutting two continuous rods (3, 4) of a cigarette produced by a single cigarette-making machine (2) and arranged side by side with one another on the same plane, the device comprising a cutting head (10) and a cutting reaction device (12) supporting the said rods (3, 4) during cutting: the said cutting head (10) being positioned facing the said rods (3, 4) and including a drive shaft (9) substantially parallel to the said rods (3, 4) and a drum (29) rotatably supporting at least one blade (13) extending radially from the said drum (29) and adjustable in position with respect to this latter about an axis radially thereof, the said drum (29) being connected to the said drive shaft (9) by means of a coupling (32) connecting skew axes and being supported by a slide (21) movable along a cylindrical-path guide (16) to rotate with respect to the said rods (3, 4) about an axes of rotation (17) passing through the said coupling 32 and perpendicular to the plane of the rods (3, 4); characterised by the fact that the said coupling (32) is a constant velocity joint and the said drive shaft (9) extends through the said slide (21); said axis of rotation (17) intersecting the plane of the rods (3, 4) at a point equidistant between the rods themselves and being co planar with said axis of adjustment of the said blade (13), and the said drive shaft (9) being connected to the said cutting reaction device (12) by transmission means (7).

4,398,439
POSITIONING GUIDE FOR RUBBER-LIKE MATERIAL ROTARY CUTTING MACHINE

Donald A. Bryan, Buchanan, and William C. Maxey, Bedford, both of Va., assignors to Rubatex Corporation, Bedford, Va.

Filed Dec. 23, 1981, Ser. No. 333,761
Int. Cl.[3] B26D 3/16; B65H 51/14
U.S. Cl. 83—356.3 12 Claims

1. A positioning guide for accurately positioning and guiding lengths of elongated rubber, plastic and other resiliant stock material having a predominantly cylindrical exterior surface configuration being fed along a predetermined straight feed path to a cutting machine having a rotary knife structure moving in a cutting plane transversely intersecting the feed path and having a pair of endless drive belts flanking the feed path providing closely adjacent confronting drive belt reaches extending between inlet and outlet nip formations along parallel planes to engage opposite surface portions of and drive the stock material along a belt drive zone spanning a length of the feed path; the positioning guide comprising an integral elongated plate-like body of a length greater than the span of said belt drive zone having feed and discharge ends and a straight guide bore extending therethrough of circular cross-section at said feed and discharge ends, said plate-like body having a width and thickness greater than the diameter of said guide bore at said ends and having a pair of opposite elongated flat-bottomed depressions each forming a relief cavity spanning the length of said belt drive zones in top and bottom faces respectively of the plate-like body, said cavities intersecting the path of the guide bore along planes paralleling the center

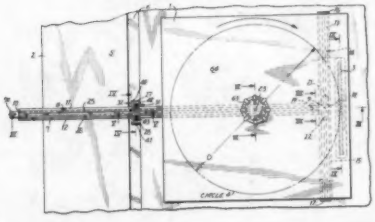


axis of the bore for the length of said belt drive zone and receiving the confronting reaches of the drive belts therein, whereby the stock material extending through said guide bore is exposed in the region of said depressions along the span of said belt drive zone for driving and positioning contact with said confronting drive belt reaches while being constrained laterally by truncated portions of said guide bores remaining between said depressions.

4,398,440
WORKPIECE MOUNTING DEVICE FOR CUTTING A CIRCLE

Harry Epstein, 687 Kildare Crescent, Seaford, N.Y. 11783

Filed Apr. 10, 1981, Ser. No. 253,067
Int. Cl.[3] B27B 5/00, 9/04
U.S. Cl. 83—439 7 Claims



1. a device for mounting a workplace on the table of a motor-driven saw blade to cut a circle of a selected diameter in the workpiece, said table having a planar work surface in a miter groove formed therein and said saw blade being mounted in operative proximity with said work surface in spaced relation with said miter groove, said device comprising

a guide member having a linearly extending guide groove formed therein;

a pivot pin guided in said guide groove in substantially perpendicular relation with said guide member and releasably securable to said guide member at a selected point of said guide groove;

a mounting clamp for releasably securing said guide member to the miter groove of the table of a motor-driven saw blade in a manner whereby said guide member abuts the planar work surface of said table with said guide groove substantially prependicular to said miter groove and said pivot pin extending substantially perpendicularly to said work surface at a selected distance from said saw blade so that a workpiece tototably mounted on said pivot pin

substantially parallel to said work suface is cut in a circle by said saw blade as said workpiece is rotated, the diameter of said circle being twice the distance of said pivot pin from said saw blade; and

wherein said guide member has a length and flanges extending along its length, and said mounting clamp comprises a base member accommodated in said miter groove and having securing means for releasably securing said base member in said miter groove and clamping means for releasably clamping the flanges of said guide member.

4,398,441

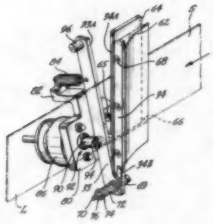
LABEL CUTTER FOR IMPACT PRINTERS

Clifford T. Jue, Edmonds, Wash., assignor to Interface Mechanisms, Lynnwodd, Wash.

Continuation of Ser. No. 90,289, Nov. 1, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,240

Int. Cl.³ B23D *17/00*

U.S. Cl. 83—575 **17 Claims**



1. An improved high speed label cutter for printing apparatus, said cutter comprising:

a first blade having an elongated, linear cutting edge formed thereon;

a second blade having an elongated, linear cutting edge formed thereon;

first means pivotally securing a first end of said first blade to a corresponding first end of said second blade so that said cutting edges thereof face each other and so that said cutting edge of said first blade is free to rotate in a predetermined plane in which is located said cutting edge of said second blade;

second means coupled to said first blade at a point between said first end and a second end thereof, for yieldably rotating said first blade to a rest position angularly disposed from said second blade in said predetermined plane, and for yieldably deflecting said second end of said first blade away from said predetermined plane so that said cutting edge of said first blade is pressed into a progressively ascending point contact with said cutting edge of said second blade as said first blade is rotated from said rest position toward said second blade, the mass of said first blade being greater at said second end thereof than at said first end thereof, said mass of said second end being sufficient to retard movement of said second end of said first blade in a direction transverse to said predetermined plane so as to maintain said cutting edge of said first blade in contact with said cutting edge of said second blade throughout a cutting stroke as said first blade is rotated from said rest position at a predetermined speed; and,

third means that can be selectively actuated to rotate said first blade from said rest position toward said second blade.

4,398,442

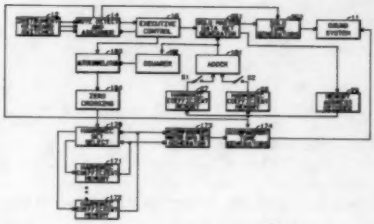
AUTOMATIC ADAPTIVE SELECTION OF ACCOMPANIMENT TONE CONTROLS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Feb. 26, 1982, Ser. No. 352,973

Int. Cl.³ G10H *1/08, 1/36, 7/00*

U.S. Cl. 84—1.17 **9 Claims**



1. In a musical instrument having a number of tone generators, in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed and transferred sequentially to a digital-to-analog converter to be converted into audible musical tones, apparatus for selecting a combination of accompaniment musical tones from a library of accompaniment musical tones which complement a selected solo musical tone comprising:

a coefficient memory for storing a set of solo harmonic coefficient values,

a first means for computing a solo master data set comprising a plurality of data points defining the waveform of a solo musical tone from said stored set of solo harmonic coefficient values,

a solo means for producing a solo musical tone from said solo master data set,

a second means for computing responsive to said stored set of solo harmonic coefficient values whereby a set of autocorrelation function data values are computed,

a plurality of accompaniment harmonic coefficient memories each storing a set of accompaniment harmonic coefficient values and a zero crossing value,

an accompaniment addressing means for accessing a set of accompaniment harmonic coefficient values and a zero crossing value from each of said plurality of accompaniment harmonic coefficient memories,

a tone selection means responsive to said set of autocorrelation values and each said zero crossing value accessed by said accompaniment addressing means whereby a multiplicity of selection numbers are generated,

a third means of computing responsive to accompaniment harmonic coefficient values accessed from said plurality of accompaniment harmonic coefficient memories whereby an accompaniment master data set comprising a plurality of data points defining an accompaniment musical tone is computed,

an harmonic selection means interposed between said plurality of accompaniment coefficient memories and said third means for computing whereby selected accompaniment harmonic coefficient values accessed by said accompaniment addressing means are transferred to said third means for computing in response to said multiplicity of selection numbers, and

an accompaniment means responsive to said accompaniment master data set whereby said combination of accompaniment musical tones are produced which complement said solo musical tone.

4,398,443

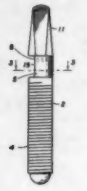
PRECISION TUNING PIN FOR PIANOS

Bruce F. Kovach, 5918 Radnor, Detroit, Mich. 48224

Filed May 21, 1982, Ser. No. 380,523

Int. Cl.³ G10C *3/10*

U.S. Cl. 84—201 **1 Claim**



1. A metallic tuning pin for pianos and like instruments comprising a body portion substantially the whole length of which is adapted to be placed in and held by the pin board of the instrument, a head shaped for turning the pin by a tuning hammer, a neck between said body portion and said head for the winding of the string therearound, said neck being reduced in diameter only on the side which the string leaves the pin when the string is up to pitch, thus forming a pin neck which is more elliptical than circular in shape, the said reduced side of which has a less acute surface curvature than that of the pin body, and a string hole in said neck.

4,398,444

PLECTRUM

John Walker, 2, Hurst Close, Hook Heath Rd., Woking, Surrey GU22 0DU, England

Filed Jan. 29, 1982, Ser. No. 343,945

Claims priority, application United Kingdom, Feb. 9, 1981, 8103927

Int. Cl.³ G10D *3/16*

U.S. Cl. 84—322 **6 Claims**

1. A plectrum for a stringed musical instrument comprising a relatively thin body of substantially planar form having a section adapted to be gripped by a player and a section along one edge having at least two outwardly extending pick members lying in direct opposition to each other, one of said pick members being coplanar with said gripping section and the remaining pick member being inclined from said one coplanar pick member whereby said plectrum may be employed to selectively strike a string of the instrument one or more times during a single stroke.

4,398,445

GUN MUZZLE CLAMP

George W. Ulrich, St. Louis County, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

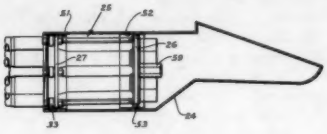
Filed Aug. 27, 1981, Ser. No. 296,719

Int. Cl.³ B64D *7/06;* **F41F** *17/12*

U.S. Cl. 89—14 C **5 Claims**

1. In a Gatling type gun having a plurality of rotatable gun barrels, an improvement comprising,

a stationarily mounted blast diffuser attached to said gun and extending around the forward ends of said gun barrels, said blast diffuser having first and second seal strips spaced apart inside said blast diffuser, and



a barrel clamp secured to each of said plurality of gun barrels and rotatably supported by said blast diffuser, said barrel clamp having first and second supporting elements engaging said seal strips.

4,398,446

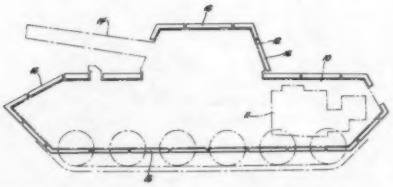
ADJUSTABLE COMBAT VEHICLE ARMOR

Victor H. Pagano, and William J. Seyfert, both of Oakland, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 14, 1980, Ser. No. 168,934

Int. Cl.³ F41H *7/04*

U.S. Cl. 89—36 H **2 Claims**



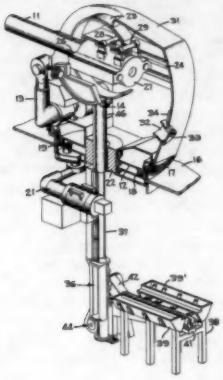
1. A military combat vehicle comprising a chassis having an outer wall **(18)** defining the vehicle envelope, said chassis wall average areal density being sufficient for chassis structural integrity but insufficient for substantial anti-ballistic effect; a multiplicity of regularly-spaced blind holes formed in the outer surface of said chassis outer wall **(18)**, the blind holes being internally threaded; a first set of add-on armor panels **(16*a*)** positionable flatwise directly on the outer surface of the chassis outer wall with no clearance space therebetween; a second set of add-on armor panels **(16)** positionable in outwardly spaced relationship to the first set of armor panels; panel-retention bolts **(19)** extending through the second armor panels and first armor panels into the aforementioned blind holes, and spacers **(26)** associated with the bolts in the spaces between the first armor panels and the second armor panels; a propulsion system **(11)** within the chassis; and a suspension system carried by the chassis for minimizing terrain shocks imposed on the chassis during vehicle movement; the propulsion system and suspension system being sized and designed to operate with the add-on armor panels in place on the vehicle; the above-described hole-bolt type connection mechanisms permitting replacement of the add-on panels with different add-on armor systems devised after initial manufacture of the vehicle; the areal density of said first and second add-on armor panels being appreciably greater than the chassis wall areal density, whereby panel replacement procedures can be employed to drastically alter the anti-ballistic characteristics of the vehicle.

4,398,447

VERTICAL LOADING SYSTEM FOR A GUN MOUNT

Robert M. Harris, New Hope, and Edward R. Betzold, Golden Valley, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 19, 1981, Ser. No. 235,884
Int. Cl.³ F41F 9/04
U.S. Cl. 89—46 **5 Claims**



1. A loading system for a gun mount wherein the gun has a barrel and a breech with a breech block movable between closed and open positions, the gun being supported above an underlying storage region for ammunition components and being surrounded by a protective cover which is movable with the gun only in azimuth, comprising

means for elevating the gun barrel to a vertical position,

means for disposing an ammunition round in vertical orientation, said last named means being situated below and aligned with the breech of the gun when the gun barrel is in said vertical position,

a hoist engaging the vertically oriented ammunition round,

means for driving said hoist to lift the round directly into the breech when the breech block is open,

a latch operating to move between positions engaging and disengaging the lower end of the ammunition round in the breech, said means for driving further operating to lower the hoist away from the breech after said latch is engaged, so that the breech block may thereafter be closed and the gun directed and fired,

said means for elevating further operating to bring the gun barrel to a predetermined intermediate elevation position after the round is spent by firing,

means for sequentially disengaging said latch from the lower end of the spent round and extracting the spent round from the breech when the gun is in said predetermined intermediate elevation position and the breech is open,

a door in the gun cover disposed adjacent to the breech when the gun is in said predetermined intermediate elevation position, and

means for opening said door when the spent round is being extracted and for closing said door otherwise.

4,398,448

BUFFERED BOLT ASSEMBLY

Clifford E. LaFever, Mission Viejo, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

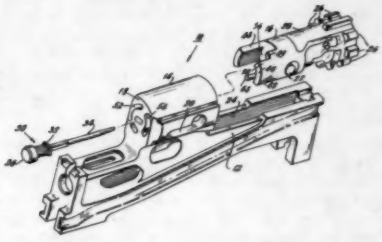
Filed Jul. 31, 1981, Ser. No. 288,828
Int. Cl.³ F41D 11/12
U.S. Cl. 89—185 **3 Claims**

1. A buffered bolt assembly, comprising:

a bolt having a forward end, an aft end, and having bolt extension means extending aft from said aft end, said bolt operatively disposed in said assembly in first and second axial positions, said bolt includes;

two bolt extensions each having a respective cross section having the shape of a respective circular arc;

cam pin means disposed thereon; and a bolt carrier having a bolt carrier sleeve, said bolt carrier sleeve having an open forward end, said bolt being received in said open forward end; and said bolt carrier sleeve having an aft end and having slot means formed in its said aft end for allowing said bolt extension means to extend through said aft end of said bolt carrier sleeve, said slot means comprises two slots which receive respective extensions of said bolt, said



bolt extension means extending through said slot means when said bolt is in said first axial position and the aft end of said bolt extension means being flush with the outer aft surface of said bolt carrier sleeve when said bolt is in said second axial position, which includes;

a latch operatively disposed therein for latching said bolt in said second axial position;

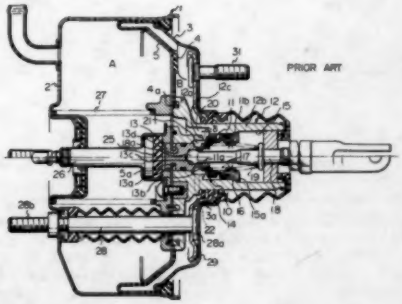
cam guide means disposed therein, said cam pin means being received in said cam guide means, for guiding said bolt between first and second rotational positions; said bolt being in said first rotational position when it is in said first axial position and in said second rotational position when it is in said second axial position.

4,398,449

PNEUMATIC SERVO BOOSTER

Toshio Takayama, Yokohama, and Hiromi Ando, Tokyo, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Jan. 16, 1981, Ser. No. 226,173
Claims priority, application Japan, Jan. 21, 1980, 55-5511
Int. Cl.³ F15B 9/10
U.S. Cl. 91—376 R **4 Claims**



1. A pneumatic servo booster comprising:

a shell housing including front and rear shells;

a valve body slidably extending through an opening formed in said rear shell;

a flexible diaphragm connected to said valve body and parti-

tioning the interior of said shell housing into a first chamber adapted to be connected to a vacuum source and a second chamber;

a plunger slidably fitted in a bore in said valve body and connected to an input rod extending through a rear end of said valve body;

a valve mechanism incorporated within said valve body and including a poppet valve within said valve body, a first valve seat on said valve body and a second valve seat on said plunger, said valve mechanism including means for connecting said first and second chambers when said poppet valve is spaced from said first valve seat and seated on said second valve seat;

said plunger being movable by said input rod in a forward direction away from said poppet valve during an actuating stroke, whereby the servo booster including said valve body actuates in said forward direction, and upon release of the input pressure to said input rod, said plunger moves in a rearward direction toward said poppet valve in a return stroke, whereby the servo booster including said valve body returns in said rearward direction;

at least one reinforcing rod extending through the interior of said shell housing and between said front and rear shells and fixed thereto; and

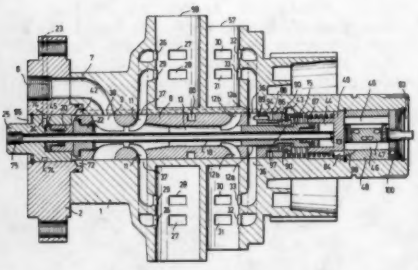
return movement restricting means in cooperation with said reinforcing rod for restricting the return movement of said valve body with respect to said shell housing in said rearward direction, for restricting the return movement of said plunger with respect to said shell housing in said rearward direction, and for defining a normal non-actuated condition of the servo booster such that at a rearwardmost position of said plunger said poppet valve engages with both said first and second valve seats.

4,398,450

HYDRAULIC MOTOR

Aaro I. Louhio, Helsinki, Finland, assignor to Oy Partek AB, Finland

Filed Jul. 30, 1980, Ser. No. 173,731
Claims priority, application Finland, Aug. 1, 1979, 792406
Int. Cl.³ F01B *1/06*
U.S. Cl. 91—477 **8 Claims**



1. A hydraulic motor having an axle with an internal bore, said motor operated by a pressure medium carried in supply and return lines respectively for connection to a reservoir and power supply separate from the motor, said motor comprising first and second sets of cylinders with included pistons radially surrounding the motor axis, the diameter of the cylinders of said first set being smaller than the diameters of said second set;

means internally of the motor and axially movable therein for directing the pressure medium into any one of (a) the two sets of cylinders in combination creating a first motor speed range, (b) the larger diameter cylinder set only creating a second motor speed range, and (c) the smaller diameter cylinder set only creating a third motor speed range, said axially movable pressure medium directing means including a first hollow valve spindle disposed inside the bore of said axle and movable between first and second axially spaced apart positions, the outer wall of first spindle having therein a first opening located to connect the interior space of said spindle with the pressure medium supply line in both positions of said spindle, a second opening located and dimensioned to connect the interior space of said first spindle with the pressure supply conduits of the larger cylinder set when said spindle is in its first position, the connection being broken when said spindle is in its second position, the third opening located to connect the interior space of said first spindle with the pressure supply conduits of the smaller cylinder set when said spindle is in its second position, a fourth opening located to connect the interior space of said first spindle with the pressure supply conduits of the smaller cylinder when said spindle is in its first position, an axial recess located to connect the return conduits of both cylinder sets within the pressure medium return line, and a separate radial groove and axial passageway located to connect the return conduits of the larger cylinder set to the reservoir when said first spindle is in its second position;

a second hollow valve spindle having a portion disposed inside said first spindle and a second portion adjacent the end of said first spindle within the axial bore, said second spindle being movable between first and second axially spaced apart positions, the portion of said second spindle disposed inside said first spindle being of a length that permits the connection between the interior space of first spindle to the pressure supply conduits of the smaller cylinder set through the opening of said first spindle when said second spindle is in its first position relative to said first spindle and which in the second position of said second spindle relative to said first spindle blocks this connection, the outer wall of the portion of said second spindle disposed within said first spindle and the inner surface of the cylindrical wall of said first spindle having axial grooves formed therein that communicate with one another and connect the fourth opening with the reservoir when said spindle is in its second position relative to first spindle;

a piston axially adjacent and in contact with said first valve spindle to move said first valve spindle when pressure is supplied to said piston;

means for controlling the movement of said axially movable means to select the speed range desired; and

supply conduits and return conduits for said pressure medium interconnecting the cylinders of said first set with said axially movable pressure medium directing means, the cylinders of said second set with said axially movable pressure medium directing means, and said control means with said axially movable pressure medium directing means.

4,398,451

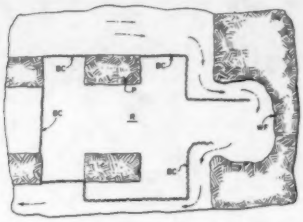
METHOD OF VENTILATING UNDERGROUND MINES AND IMPROVED BRATTICE CLOTH CONSTRUCTION USEFUL THEREIN

Neil J. Werthmann, Severna Park, Md., assignor to Polyweave Products, Inc., Severna Park, Md.

Continuation-in-part of Ser. No. 838,092, Sep. 3, 1977, abandoned. This application Mar. 23, 1979, Ser. No. 23,252
Int. Cl.³ E21F *1/14*
U.S. Cl. 98—50 **15 Claims**

1. In a method of ventilating an underground mine in which the flow of ventilating air is directed to active working areas of the mine and substantially excluded from non-working areas and corridors by means of flexible brattice cloth curtains disposed in appropriate locations across the openings to said non-working areas and corridors, the improvement wherein said brattice cloth curtain comprises a dense, strong, coherent felt-like freely flexible blanket formed from at least one batting of natural or synthetic textile staple fiber having a staple length of at least one inch, all such battings together having a thickness greater than said felt-like blanket and being needle-

punched to cause a substantial portion of the fibers thereof to be disposed within said batting and become entangled, interengaged and compacted into said felt-like blanket, said brattice cloth having flammability characteristics at least sufficient to withstand the "match test" as defined in the specification and



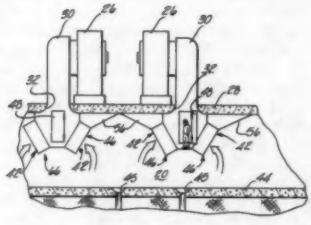
satisfy any more stringent governmental promulgated standard for brattice cloth, a density sufficient to convey said flow of ventilating air within said mine, and a tensile strength sufficient to support its own weight when hung in ceiling height lengths.

4,398,452

ENERGY RECOVERY HEAT EXCHANGER INSTALLATION

Norman F. Bradshaw, Richmond, England, assignor to Haden Schweitzer Corporation, Madison Heights, Mich.

Filed Nov. 10, 1980, Ser. No. 205,488
Int. Cl.³ B05C *15/00*
U.S. Cl. 98—115 SB **3 Claims**



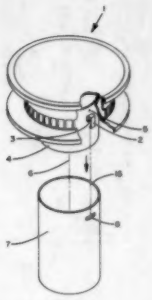
1. A system for recovering energy out of exhaust air from the site of an industrial operation such as painting comprising:
- an exhaust air collection passage;
- an exhaust air disposal passage;
- recovery means mediate said collection and disposal passages and comprising a substantially horizontal partition, a fabricated metal enclosure depending from said partition into said collection passage and first and second heat exchanger units secured to said enclosure; each enclosure having two intake openings through which air may flow from said collection passage into said enclosure;
- said units being disposed in reversely symmetrical inclined relationship with one another such that the lower ends thereof are converging;
- a normally closed access door into said enclosure mediate said units, selectively actuable cover means on said units for covering the intake openings thereof, with said cover means in place on said intake openings and said access door open, air is directed through said access door and bypasses said units; and
- turbine means down stream of said units for causing air to move from said collection passage into said enclosure and thence to said disposal passage.

4,398,453

FLUE PIPE CONNECTOR FOR A VENT CAP

Herman W. Wilkerson, Carmel, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 30, 1981, Ser. No. 306,986
Int. Cl.³ F23L *17/02*
U.S. Cl. 98—122 **4 Claims**



2. A flue pipe cap connector to releasibly secure a flue pipe cap to the end of a flue pipe wherein the flue pipe has a slot cut in the wall thereof a predetermined distance from the end of the flue pipe and wherein a tubular portion of the flue pipe cap extends into the flue pipe, said connector comprising:
- a unitary strip of resilient material having an elongated center portion, a shoulder portion extending at essentially right angles from one end of said center portion, a connector portion extending from the end of the shoulder portion essentially parallel to the center portion, and a clip portion extending from the other end of the center portion back toward the shoulder portion, said clip portion being slightly longer than said shoulder portion, and said clip portion having a beveled outer edge which contacts the outside surface of the flue pipe to provide a surface for sliding contact between the beveled outer edge and the outside surface of the flue pipe; and
- a fastening means for securing the connector portion to the tubular portion of the flue pipe cap, said center portion being of a length essentially equal to the distance of the slot from the end of the flue pipe whereby when the tubular portion of the flue pipe cap is inserted into the flue pipe and the end of the flue pipe abuts the shoulder portion, the resilient action of the center portion forces the clip portion to extend into the slot and whereby rotation of the flue pipe cap within the flue pipe causes the beveled outer edge of the clip portion to ride out of the slot onto the outside surface of the flue pipe against the resilient action of the center portion.

4,398,454

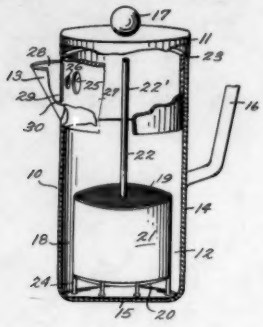
AESTHETIC WHISTLING COFFEEPOT

Emanuel E. Lambros, 40 - 11th St., and James H. Wolfston, P.O. Box 3100, both of Wheeling, W. Va. 26003

Filed Dec. 1, 1980, Ser. No. 211,860
Int. Cl.³ A47J *31/46*
U.S. Cl. 99—285 **11 Claims**

1. A coffeemaker comprising:
- a pot having a closed bottom, a circumferentially continuous side wall, and an open top, and a handle extending from the side wall;
- a pouring spout extending from a portion of the exterior side wall opposite the handle;
- a basket mounted in the pot for containing coffee, and having lift-out means extending upwardly therefrom toward the open top;
- a lid for closing the open top and including a handle portion

located centrally on top of the lid; said lid having a depending skirt portion with a smaller outside diameter than the inside diameter of the pot, and overlapping the pouring spout;



means defining a pair of openings in the depending skirt; and whistle means associated with one of said skirt openings, while the other opening remains free.

4,398,455

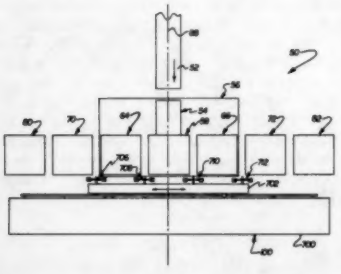
STACKER-TYER

Richard J. Merwarth, Plattsburgh, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 1, 1981, Ser. No. 279,670

Int. Cl.³ B65B *13/00*

U.S. Cl. 100—7 **23 Claims**



11. An apparatus for receiving a stream of sheet-like articles, forming the sheet-like articles into stacks and tying the stacks, said apparatus comprising stacking means for receiving an incoming stream of sheet-like articles and for building a series of stacks of said articles from said stream, first and second tying mechanisms for tying said stacks, said first and second tying mechanisms being located on opposite sides of said stacking means, and transfer means for moving each succeeding stack of said series of stacks laterally and alternately toward one or the other of said tying mechanisms and for maintaining the sheet-like articles forming each of said stacks in alignment while being moved toward one or the other of said tying mechanisms.

4,398,456

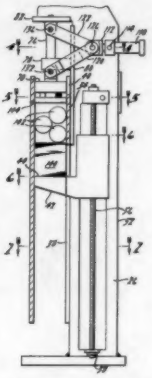
MACHINE FOR CONVERTING RETURNABLE CANS INTO METAL INGOTS

Larry P. Prater, 9802 William, Taylor, Mich. 48180

Filed Aug. 12, 1981, Ser. No. 292,318

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—98 R **10 Claims**



1. A machine for creating a solid mass of crushed cans from individual used metal cans comprising a chamber, first means within the chamber on which the mass of crushed cans is supported, second means operable within the chamber to crush the cans to flattened conditions and pierce the flattened cans so that the flattened cans join together at the points of piercing thereby forming the solid mass of crushed cans, the first means comprising a platen movably mounted on the machine for movement relative to the chamber and which is increasingly moved within the chamber away from the second means as more cans are crushed and joined to the solid mass of crushed cans so that the location within the chamber at which cans are crushed and joined to the solid mass of crushed cans remains substantially the same irrespective of the size of the solid mass of crushed cans, and wherein the platen has a support portion within the chamber on which the mass of cans is supported and a further portion exterior of the chamber, and drive means engaging said further portion for adjusting the position of the support portion within the chamber.

4,398,457

MARKING APPARATUS FOR PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICES

Fumio Takahashi, and Yuji Miura, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 23, 1981, Ser. No. 276,531

Claims priority, application Japan, Jun. 30, 1980, 55-87747

Int. Cl.³ B41F *17/00*

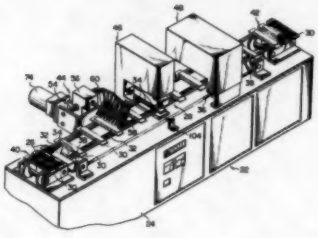
U.S. Cl. 101—44 **3 Claims**

1. A marking apparatus for marking at least one plastic encapsulated semiconductor device with marking-obstructive substances thereon comprising a conveying mechanism for conveying the semiconductor device, a pretreatment mechanism for removing the marking-obstructive substances from the top surface of the semiconductor device conveyed thereto by the conveying mechanism, a stamping mechanism for stamping a mark on the semiconductor device having the marking-obstructive substances removed therefrom by the pretreatment mechanism and transferred thereto by the conveying mechanism, and a curing mechanism for curing the mark stamped on the semiconductor device transferred thereto by the conveying mechanism;

said conveying mechanism including endless chains, a plu-

rality of carrying members disposed on the endless chains to move together therewith and conveyed in accordance with the drive of the endless chains, each carrying member bearing at least one semiconductor device, a plurality of feed members attached to the endless chains, each feed member engaging the corresponding carrying member so that the carrying member may be moved by the feed member, and an intermittent drive mechanism for driving carrying members and stopping carrying members at positions where the carrying members severally face the pretreatment mechanism, the stamping mechanism, and the curing mechanism;

said pretreatment mechanism including torch nozzles severally facing the semiconductor devices and emitting flames from their respective distal ends, a support mechanism for rotatably supporting the torch nozzles between a first position where the distal ends of the torch nozzles face their corresponding semiconductor devices and a second position where the distal ends do not face the semiconductor devices, and a driving mechanism for driving the torch nozzles to rotate between the first and second positions,



the distal ends of each torch nozzle facing the top surface of each corresponding semiconductor device when the torch nozzle is in the first position, and the marking-obstructive substances on the top surface are removed by burning the top surface with a flame from the torch nozzle in the first position, whereby said top surface is pretreated, said driving mechanism moving the distal end of each torch nozzle in the first position along the top surface of each corresponding semiconductor device, whereby the whole area of said top surface is pretreated;

said stamping mechanism including rubber stamps severally facing the semiconductor devices and inked correspondingly to the marks and an abutment mechanism for causing the rubber stamps to abut against their corresponding pretreated semiconductor devices, whereby stamping is achieved by transferring ink attached to the rubber stamps to their corresponding pretreated semiconductor devices, said ink being formed of a material which is hardened by ultraviolet rays; and

said curing mechanism being provided with a lamp emitting ultraviolet rays.

4,398,458

ADJUSTMENT DEVICE FOR POSTAGE METERING AND VALUE STAMPING MACHINES

Horst Denzin; Wolfgang Von Inten, and Horst Päch, all of Berlin, Fed. Rep. of Germany, assignors to Francotyp Gesellschaft mbH, Berlin, Fed. Rep. of Germany

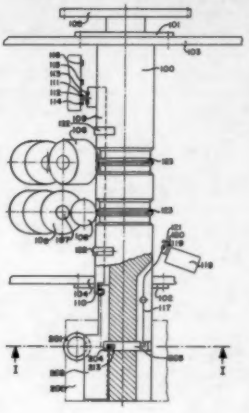
Filed Mar. 16, 1982, Ser. No. 358,700

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111949

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—91 **10 Claims**

1. Adjusting device for postage metering and value stamping machines for adjusting printing rollers and cylinders comprising type wheels mounted in a printing cylinder having a shaft, each of said type wheels having a respective stepping motor operatively associated therewith for adjusting the respective type wheel by means of a respective toothed rack and a respective double toothed rack, said toothed racks and said stepping motors being disposed radially to said printing-cylinder shaft and said double toothed racks being disposed parallel to one another, a selective printing roller adjustable by one of said double toothed racks via a belt drive, said toothed racks and said double toothed racks being coupled by a hook-connection,



one of the respective toothed and double toothed racks having a widened hook-shaped part, said double toothed racks being adjustable beyond a maximally required number of steps of said type wheels, and the ends of said double toothed racks being guidable laterally out of said printing cylinder for actuating respective levers to adjust, in a stepwise manner, further printing rollers.

4,398,459

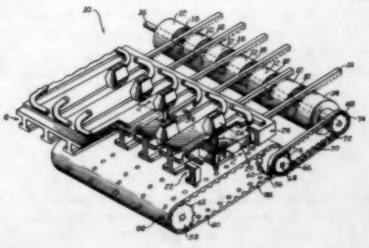
BAR CODE PRINTER WITH AUTOMATIC MECHANICAL PARITY

Kenneth L. Guenther, Park Ridge, and Edward H. Zemke, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 18, 1982, Ser. No. 349,782

Int. Cl.³ B41T *9/12*

U.S. Cl. 101—93.01 **9 Claims**



1. A printing device to print codes corresponding to characters comprising:

a plurality of code printing wheels, each printing wheel having a series of codes and each code corresponding to a character;

a plurality of operator movable selector means, each selector means connected to its respective code printing wheel and

being capable of being positioned to correspond respectively with a character, each selector means serving as means for incrementing or decrementing its respective printing wheel in response to incrementing or decrementing the selector means;

selector interlock means for preventing more than one of the selector means from being moved at any one time;

parity character generation means comprising:

a parity code printing wheel having a series of codes with each code corresponding to a parity character, the parity wheel mounted on a shaft,

mechanical connecting means connected to and between the parity code printing wheel and the selector means,

the movement of the selector means causing a corresponding directly proportional movement in the mechanical connecting means and in turn proportional rotational movement in the parity code printing wheel,

whereby a single unit of movement in the selector means causes a corresponding single unit of rotational movement in the parity wheel.

4,398,460

PRINTER

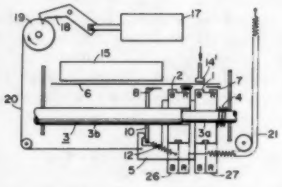
Kazumi Sekine, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,134

Claims priority, application Japan, Apr. 24, 1980, 55-55217

Int. Cl.³ B41J *1/50, 27/14*

U.S. Cl. 101—93.15 **8 Claims**



1. A printer, comprising:

a type font wheel mounted on a shaft and having a plurality of type font rings mounted on and arranged along the shaft for printing in respective different colors;

a mask for simultaneously shielding all but a selected one of said plurality of type of font rings from a printing paper, and for exposing said rings one at a time;

means for striking a type provided on the exposed type font ring to imprint a character on the printing paper;

means for moving said type font wheel together with said mask along the shaft; and

means for changing a relative position between said type font wheel and said mask to permit said exposure of said rings one at a time.

4,398,461

SMALL PRINTER

Isomu Koike, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, Japan

Filed Aug. 6, 1981, Ser. No. 290,443

Claims priority, application Japan, Aug. 8, 1980, 55-109007; Sep. 2, 1980, 55-121617

Int. Cl.³ B41J *1/48*

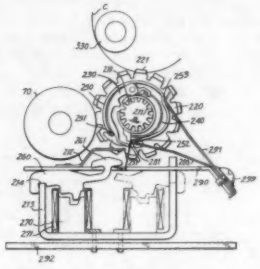
U.S. Cl. 101—99 **21 Claims**

6. A printing device of small size comprising:

at least one typing wheel having a plurality of selected letters, characters and symbols around the periphery thereof;

selection means for selecting for printing one of said plurality of letters, characters and symbols on said at least one typing wheel;

printing means for printing said selected letter, character or symbol selected by said selection means by applying pressure thereto, said printing means including a pair of bearing plates and a crank shaft, said crank shaft, when driven, having an oscillatory motion about a rotational axis, said pair of bearing plates being fixed to said crank shaft and having substantially L-shaped bearing grooves, said bearing grooves having a portion of long radius about said rotational axis of said crank shaft and a portion of shorter radius about said axis, a printing roller engaging said



L-shaped bearing grooves of said bearing plates, said printing roller being rotatably held by said grooves, said bearing grooves being adapted to cause said printing roller to engage said long radius portion of said bearing grooves when said bearing plates are driven by said crank shaft rotating in a first direction in said oscillatory motion, and said grooves being further adapted to cause said printing roller to engage said shorter radius portion of said bearing groove when said bearing plates are driven by said oscillatory motion of said crank shaft in a second direction, the distance of said printing roller from said axis of crank rotation being less in said second direction than in said first direction.

4,398,462

HOT MELT SCREEN PRINTING MACHINE

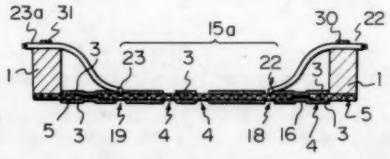
Tadao Okano, Toride, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,134

Claims priority, application Japan, May 30, 1979, 54-67183; Aug. 17, 1979, 54-104605; Dec. 13, 1979, 54-162088

Int. Cl.³ B41L *13/02;* **H05B** *3/16*

U.S. Cl. 101—128.21 **13 Claims**



1. A hot melt screen printing having a screen plate, said screen plate comprising:

a metalic frame

a screen mesh fixed to sais frame, said screen mesh formed from a plurality of insulating material fibers and an electroless, conductive plating layer formed on each of the fibers in first and third regions of said screen mesh, said first and third regions being separated and electrically insulated from each other by a second region, the insulating material fibers of

said second region not having a conductive plating layer formed thereon, a resin coating applied onto said mesh on predetermined portions thereof, the portions of said mesh not included in said predetermined portions forming a printing pattern and electrode patterns; and

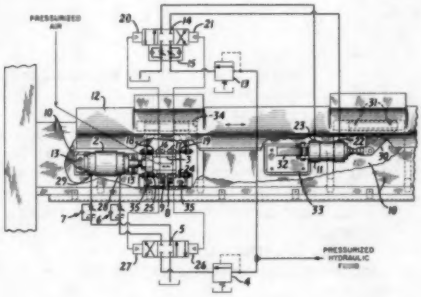
power supply means for supplying an electric current to said screen mesh, said power supply means having electrodes coupled to said screen mesh at said electrode patterns thereon.

4,398,463

NON-REPEAT DOCTOR BLADE DRIVE

Ralph A. Yessler, II, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Filed Aug. 19, 1981, Ser. No. 294,317
Int. Cl.³ B41F 9/10
U.S. Cl. 101—169 **26 Claims**



1. In a printing press having a frame, a printing cylinder, a press drive, and a doctor blade engaging a surface of said cylinder and longitudinally displaceable along said cylinder, a drive for oscillating said doctor blade along said cylinder in a non-repeat motion comprising:

(a) a doctor slide coupled to said doctor blade and mounted on said frame to be moveable in said longitudinal direction;

(b) first drive means arranged between said doctor slide and said frame for moving said doctor slide back and forth in said longitudinal direction;

(c) reference indicia means comprising first reference indicia, second reference indicia, and means for moving one of said reference indicia back and forth relative to the other;

(d) a control member;

(e) second drive means for moving said control member back and forth relative to said reference indicia;

(f) means for actuating said first drive means including a first control means independent of said press drive and responsive to the position of said control member relative to one of said first reference indicia and said second reference indicia for controlling the actuation of said first drive means for reversing the direction of movement of said doctor slide; and

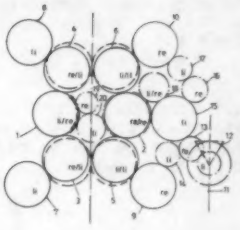
(g) second control means responsive to the position of said control member relative to the other of said first reference indicia and said second reference indicia for actuating said second drive means for reversing the direction of movement of said control member.

4,398,464

REVERSIBLE-DRIVE OFFSET ROTARY PRINTING MACHINE

Rudolf Morbitzer, Augsburg, and Werner Kleininger, Neusäss, both of Fed. Rep. of Germany, assignors to M.A.N. -Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,259
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048840
Int. Cl.³ B41F 7/10
U.S. Cl. 101—177 **10 Claims**



1. Rotary offset printing machine having a printing system including

four plate cylinders (**7, 8, 9, 10**):

four rubber cylinders (**3, 4, 5, 6**) and first and second impression cylinders (**2, 1**), whereby the printing system will have ten cylinders, said cylinders being rotatably supported with the axes of rotation of the rubber cylinders being movable;

axially movable drive gears (**1'–10'**) positioned in driving engagement with respective cylinders,

and comprising, in accordance with the invention,

a main drive train (**12, 13, 15**);

a first rotation-reversal gear (**18**) located in rotation-transmitting position with respect to the main drive train;

the drive gear (**2'**) on the first impression cylinder (**2**) having means, selectively, engageable with the main drive train directly, or via said first rotation-reversal gear (**18**);

a further drive gear (**20**) and a second rotation-reversal gear (**19**), the further drive gear being in driving connection with the first drive gear (**2'**) of the first impression cylinder (**2**);

the drive gear (**1'**) on the second impression cylinder (**1**) having means selectively, engageable with the further drive gear (**20**) directly, or via said second rotation-reversal gear (**19**);

a first drive train (**14**) having means selectively engageable with the main drive train (**12, 13, 15**);

a second drive train (**16, 17**) having means selectively engageable with the main drive train (**12, 13, 15**);

two each rubber cylinders (**3, 4; 5, 6**) of the four rubber cylinders forming, respectively, first and second pairs and having means movably journaled and located in symmetrically coordinate positions with respect to the first and second impression cylinders for selectively circumferential engagement with a respective impression cylinder (**1, 2**) or, for selective surface engagement of a rubber cylinder of one pair (**3, 4**) with a coordinate rubber cylinder (**5, 6**) of the other pair (**3–5; 4–6**) whereby the two engaging rubber cylinders will form rubber blanket—rubber blanket printing systems;

and wherein

(a) for rubber-impression cylinder operation, the drive gears (**3', 4'; 5', 6'**) of the pairs of rubber cylinders are selectively engageable with the drive gears (**1', 2'**) of the impression cylinders, the plate cylinders associated with respective rubber cylinders being in driving engagement with the

drive gears of the associated rubber cylinder (FIGS. 3, 4); and

(b) for rubber cylinder—rubber cylinder operation, the first drive train (14) is, selectively, engageable with the drive gear (9') of the plate cylinder (9) associated with one rubber cylinder (5) of the second pair, the drive gear thereof being engageable with the drive gear (3') of one rubber cylinder (3) of the first pair, to form a first extended gear drive train (13-14-9'-5'-3'-7') (FIG. 5), and

the second drive train (16, 17) is, selectively, engageable with the drive gear (10') of the plate cylinder (10) associated with the other rubber cylinder (6) of the second pair, the drive gear thereof being engageable with the drive gear (4') of the other rubber cylinder (4) of the second pair to form a second extended gear drive branch (15-16-17-10'-6'-4'-8').

4,398,465

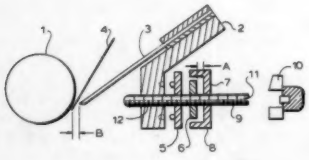
INKING DEVICE FOR PRINTING MACHINE

Boris Pozin, 35-33 83rd St., #D6, Jackson Heights, N.Y. 11372

Filed May 10, 1982, Ser. No. 376,553

Int. Cl.³ B41F *31/06*

U.S. Cl. 101—36 S **3 Claims**



1. An inking device for printing machines, comprising

an inking roller having an axis and a predetermined axial length;

an inking blade extending over substantially the entire length of said inking roller and having an edge displaceable relative to said inking roller so that a gap between said edge of said inking blade and said inking roller can be changed in a plurality of locations spaced from one another in an axial direction;

a frame member arranged to support said inking blade so that said inking blade is fixedly connected with said frame member;

a plurality of adjusting members each arranged in the region of a respective one of said locations and displaceable so as to displace said edge of said inking blade at the respective locations and thereby adjust the gap at these locations; and

reference means including two abutments spaced from one another and arranged so that when all said adjusting members simultaneously abut against one of said abutments the gap is minimum at all said locations along substantially the entire length of said inking roller, and when all said adjusting members simultaneously abut against the other of said abutments the gap is maximum at all said locations along substantially the entire length of said inking roller, each of said abutments being formed as a substantially plate-like member attached to said frame member at a distance from one another in the direction of displacement of said adjusting members and extending substantially normal to said direction, one of said plate-shaped members having a projecting lateral part extending in said direction and abutting against the other of said plate-shaped members so as to form a compartment therebetween, each of said adjusting members including an elongated threaded part extending in said direction and having one end arranged to press against said inking blade at a respective one of said locations and a transverse part extending substantially normal to said direction and parallel to said plate-shaped members and displaceable inside said compartment formed by said plate-shaped members so as to abut against one or the other of said plate-shaped members.

4,398,466

METHOD AND APPARATUS FOR AVOIDING AN UNDESIRED FIRING OF A WEAPON

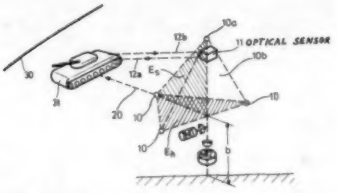
Gunther Sepp, Ottobrunn; Christian Diehl, Gruenwald; Richard Bogenberger, Wolfratshausen; Gunthard Born, Munich; Friedbert Mohr, Zorneding; Roland Schmidt, Groebenzell; Werner Schnaebele, Wolfratshausen, and Korbinian Thalmair, Freising, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,415

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019783

Int. Cl.³ F42B *23/26;* **F42C** *13/00*

U.S. Cl. 102—427 **9 Claims**



1. A method of using acoustical ranging means and optical ranging means in conjunction for avoiding an undesired firing of a weapon, such as a mine, comprising the following steps:

(a) first optically scanning the field of fire of the weapon to provide first electrical signals which define a target background image whereby all image points within the firing reach define the firing range and whereby a line between the firing range and all other image points defines the firing horizon,

(b) storing said first electrical signals in a memory,

(c) performing an acoustical target acquisition within a target zone,

(d) optically scanning the firing horizon when a target approaches the firing horizon to provide second electrical signals which may prove the presence of a target at the firing horizon,

(e) storing said second electrical signals,

(f) comparing the first and second electrical signals to provide difference electrical signals for providing a proof signal of the presence of a target at the firing horizon, and

(g) using said proof signal for a fine adjustment and for firing a weapon.

4,398,467

EXPLOSIVE FRAGMENTATION DEVICES WITH COILED WIRE PROGRESSIVELY VARIED

John W. Leigh, Sale, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 5, 1980, Ser. No. 213,755

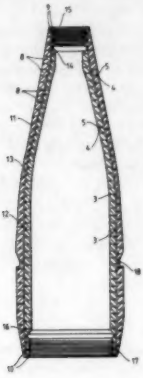
Claims priority, application United Kingdom, Dec. 13, 1979, 7943069

Int. Cl.³ F42B *13/18*

U.S. Cl. 102—491 **13 Claims**

1. A casing for an explosive fragmentation device, said casing being formed of coiled wire, the diameter of the turns in said coiled wire being varied progressively over at least a part of the length of the casing so that in longitudinal cross-section the mean profile of the said part of the casing is inclined to the longitudinal axis thereof, the wire having a pair of opposed flat faces, the wire being twisted about its longitudinally axis dur-

ing coiling so that the opposed flat faces of adjacent turns overlay one another and are oriented substantially normal to



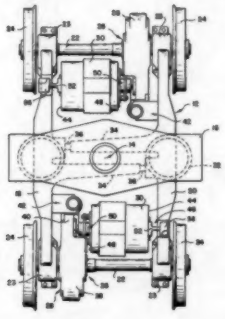
the said mean profile, and the opposed flat faces of adjacent turns being bonded together.

4,398,468

RAILWAY PROPULSION SYSTEM SUSPENSION

John D. Bell, Royal Oak, Mich., and Michael A. O'Truk, St. Peters, Mo., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 16, 1980, Ser. No. 159,789
Int. Cl.³ B61C *3/00;* **B61D** *9/50, 3/04*
U.S. Cl. 105—136 **11 Claims**



1. A propulsion suspension for a railway truck of the type which includes a pair of wheels associated with said propulsion system which are secured to opposite wheel ends of an axle which is mounted to extend transversely between adjacent axle support ends of first and second side frames of said truck, said propulsion system suspension including:

a gear box having an output end supported by said axle extending therethrough and means for resiliently securing an input end thereof to said first side frame;

a motor having means for resiliently securing a rear end thereof to said second side frame as said motor extends transversely toward said first side frame; and

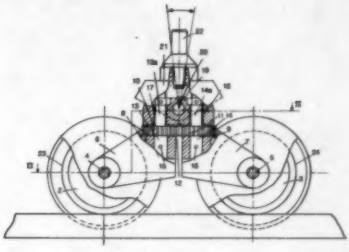
means for universally coupling said input end of said gear box to a front end of said motor including a coupling assembly between an output shaft of said motor and an input shaft of said gear box and adaptor plate which encircles said coupling assembly; said adaptor plate being secured to said front end of said motor by ball and socket means at a pair of diametrically opposed first locations thereon and to said input end of said gear box by ball and socket means at a pair of diametrically opposed second locations thereon; and each of said first locations being an equal distance from each of said second locations.

4,398,469

LATERALLY COMPENSATING RADIAL TROLLEYS

Sante Zelli, 24, Via della Pace, Rome, Italy

Filed Oct. 22, 1980, Ser. No. 199,473
Claims priority, application Italy, Oct. 22, 1979, 50638 A/80
Int. Cl.³ B61D *15/00;* **F16M** *11/00;* **G03B** *17/12, 21/14*
U.S. Cl. 105—170 **11 Claims**



1. A rail-supported carriage, adapted to be moved along a pair of rails spaced from one another at a predetermined distance,

comprising in combination:

at least three wheel assemblies, each assembly including an articulated frame, at least one wheel assembly being adapted to travel on one rail, the remaining wheel assemblies being adapted to travel on the oppositely disposed rail, and

connecting arms interconnecting oppositely disposed wheel assemblies, and compensating means mounted between the frame of each wheel assembly and at least some of said connecting arms, establishing a sliding relation therebetween for regulating any variation of lateral distance between oppositely disposed wheel assemblies due to any curvature in said rails.

6. The combination of a rail-supported carriage and a pair of rails spaced from one another at a predetermined distance,

said rail-supported carriage comprising

at least three wheel assemblies, each assembly including an articulated frame, at least one wheel assembly being adapted to travel on one rail, the remaining wheel assemblies being adapted to travel on the oppositely disposed rail, and

connecting arms interconnecting oppositely disposed wheel assemblies, and compensating means mounted between the frame of each wheel assembly and at least some of said connecting arms, establishing a sliding relation therebetween for regulating any variation of lateral distance between oppositely disposed wheel assemblies due to any curvature in said rails.

4,398,470

WALL SAFE

Alvin R. Williams, Spencerport, and Douglas E. Shaffer, Rochester, both of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

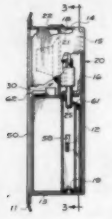
Filed Mar. 12, 1982, Ser. No. 357,707
Int. Cl.³ E05G *1/04, 1/00;* **E05B** *37/00*
U.S. Cl. 109—52 **12 Claims**

1. A wall safe comprising:

a. a steel cabinet sized for mounting flush within a wall;

b. said cabinet being formed with a frame around an open front;

c. a crossbar anchored within a rear region of said cabinet and extending along a line dividing said cabinet into a lock region and a box region;
d. a lock assembly enclosed within said cabinet in said lock region;
e. a deposit box removably lockable within said cabinet in said box region;
f. said lock assembly comprising a combination lock, an operating arm enabled to turn when said combination lock is open, and a pair of live bolts linked together for movement by said arm between locked and unlocked positions;
g. said crossbar having a pair of holes registered with said live bolts, so that when said live bolts are in said locked position,



said live bolts extend through said holes to lock said live bolts and said lock assembly to said cabinet;
h. a pair of dead bolts arranged on an inner wall of said cabinet opposite said live bolts;
i. opposite ends of said deposit box having steel channels enclosing recesses within said deposit box; and
j. outer walls at opposite ends of said deposit box having bolt receiving apertures opening into said channels, said apertures being arranged so that said deposit box can be placed in said box region of said cabinet where said dead bolts extend through a pair of said apertures and into said channels, and said deposit box can be locked in place by moving said live bolts through said crossbar and through another pair of said apertures into said channels.

4,398,471

DEVICE AND METHOD FOR PYROLYZING WASTE MATERIALS

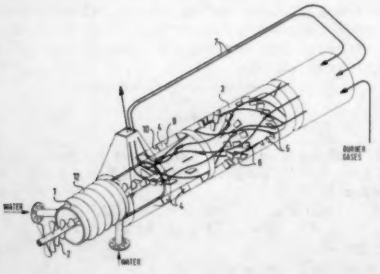
Erwin Thomanetz, Stuttgart, Fed. Rep. of Germany, assignor to Herko Pyrolyse GmbH & Co. Recycling KG, Hockenheim, Fed. Rep. of Germany

Continuation of Ser. No. 147,274, May 6, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 387,258

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918758

Int. Cl.³ F23G *3/00*

U.S. Cl. 110—235 **6 Claims**



1. A device for pyrolyzing waste materials comprising a low-temperature carbonizing reactor including a longitudinally extending tubular vessel loaded with waste materials to be pyrolyzed, a flue gas duct surrounding a shell of said carbonizing reactor and defining an annular space which concentrically surrounds said tubular vessel having hot flue gases passed therethrough for the purpose of heating the shell of said reactor, and baffle means for maintaining turbulent flow disposed about said reactor in said annular space in such a way that they are to uniformly distribute the flue gases about the periphery of said tubular vessel and to produce and maintain turbulent flow conditions throughout the area to be heated, said baffle means comprising a plurality of planar heat conducting means distributed throughout the length of said flue gas duct, a plurality of said heat conducting means each being disposed in planes containing the longitudinal axis of said annular space a plurality being disposed to define an angle with the longitudinal axis of said annular space and a plurality being disposed in planes extending at right angles to the longitudinal axis of said annular space.

4,398,472

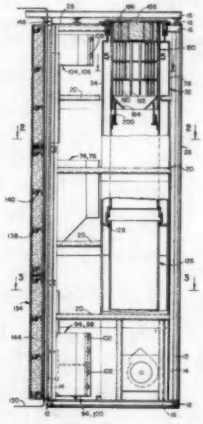
ELECTRIC BURNER FOR OXIDIZING OVEN

Richard E. Burke, Hixson, Tenn.; Edward H. Harris, Kissimmee, Fla., and Joseph W. Bolton, Signal Mountain, Tenn., assignors to Hudson Wire Company, Trenton, Ga.

Filed Jun. 10, 1982, Ser. No. 386,872

Int. Cl.³ F23G *3/04*

U.S. Cl. 110—250 **12 Claims**



1. An electric burner for an incinerating oven comprising a hollow housing elongated along a longitudinal axis and having a multiplicity of openings communicating the interior with the exterior thereof, a plurality of arcuately shaped vanes, means for mounting said vanes in spaced relationship about at least an upper portion of the interior of said housing and extending from the interior surface of the housing toward a central portion spaced from said axis, a support plate secured to and closing one end of said housing, that end being defined as the top end, a deflector plate secured to the housing adjacent the bottom end and having a substantially central aperture such that gases entering said openings may exit through said aperture, a multiplicity of elongated U-shaped electrical resistance heating elements, each of said elements having a pair of free ends adapted to receive electrical current, means carried by said support plate for mounting said elements in spaced apart relationship in said housing with the free ends extending from the top of the support plate, at least one elongated U-shaped ceramic heating element capable of operating at a surface temperature above 1400 degrees F for igniting gases flowing through said housing, each ceramic element having a pair of

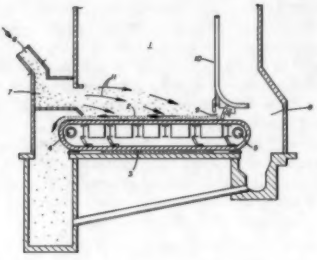
free ends adapted to receive electrical current, and means carried by said support plate for mounting said ceramic elements in said housing substantially intermediate said resistance elements with the free ends extending from the top of said support plate.

4,398,473

STOKER BACKSTOP

Dossie H. Loper, Mobile, Ala., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 21, 1982, Ser. No. 341,398
Int. Cl.³ F23N *11/10*
U.S. Cl. 110—271 **6 Claims**



1. In a solid-fuel burning furnace utilizing a moving grate stoker and having a fuel supply propelling solid fuel toward the rear of the moving grate of the stoker, including,

a stoker grate having the configuration of an endless belt on supporting parallel and horizontal rollers,

a fuel supply means mounted at the front end of the stoker to propel the solid fuel toward the rear end of the grate,

a back furnace wall having parallel water tubes extending vertically over the grate and joined to each other by welding as a membrane,

a first impact surface extending vertically downward from the furnace tubes over the rear portion of the grate,

and a second impact surface extending at an angle to the horizontal beneath the first impact surface to engage the grate surface in completing a barrier to the solid fuel discharged toward the rear of the grate.

4,398,474

INSULATING STRUCTURE FOR HIGH TEMPERATURE DEVICES

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Continuation-in-part of Ser. No. 248,836, Mar. 30, 1981, which is a division of Ser. No. 105,510, Dec. 20, 1979, Pat. No. 4,290,475, which is a continuation-in-part of Ser. No. 10,712, Feb. 9, 1979, Pat. No. 4,256,919. This application Jan. 18, 1982, Ser. No. 340,786
Int. Cl.³ F23M *5/00*
U.S. Cl. 110—336 **35 Claims**

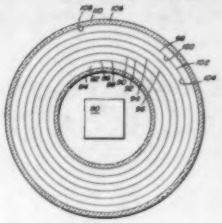
14. A furnace comprising:

a radiant heat source which in operation is at a temperature in excess of 1000° F., and

insulation for confining heat emitted from said heat source, said insulation comprising:

a shell comprising a front face of refractory material proximate said heat source and a rear face substantially parallel to said front face, said front and rear faces defining a hollow interior, and

a plurality of refractory baffles having an emissivity greater than 0.5 disposed within said hollow interior substantially



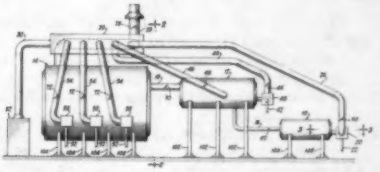
parallel to said front face and defining plural spaces therebetween.

4,398,475

HAZARDOUS WASTE INCINERATION SYSTEM

Charles W. McKiel, Jr., Oak Park, Ill., assignor to SSK Corporation, Bensenville, Ill.

Filed Jun. 15, 1981, Ser. No. 273,754
Int. Cl.³ F23G *7/04*
U.S. Cl. 110—346 **18 Claims**



1. The method of disposing of hazardous wastes which comprises the step of, burning low viscosity, high heat value liquid hazardous waste at a relatively slow rate in a first combustion chamber, supplying the gaseous products of combustion to a second combustion chamber to act as a sustained high temperature environment therein, and burning in said second chamber at a substantially increased rate liquid hazardous waste of somewhat less heat value than the hazardous waste burned in said first chamber.

4,398,476

METHOD FOR INCINERATING SEWAGE SLUDGE

Akira Suzuki, Kasukabe; Yasumi Shioya, Tokyo, and Keiichi Kimura, Tsuchiura, all of Japan, assignors to Shinryo Air Conditioning Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,988
Claims priority, application Japan, Sep. 19, 1980, 55-130308; Jul. 8, 1981, 56-106338
Int. Cl.³ C10B *53/00*; F23G *5/04, 5/12*
U.S. Cl. 110—346 **5 Claims**

1. A method of incinerating sewage sludge which comprises the steps of:

(a) pelletizing dewatered sludge having a water content of 70 to 75% which is obtained by dewatering excess sludge from sewage treatment,

(b) drying the pellets with a heat source obtained by burning gases described hereunder which are formed by dry-distillation and gasification,

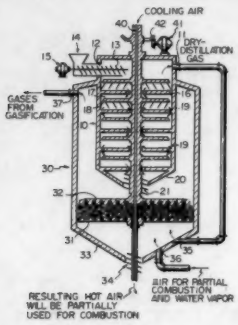
(c) dry-distilling the pellets by the sensible heat of the gas described hereunder which is formed by gasification,

(d) using part of the resulting dry-distilled gas in said drying step,

(e) burning the remainder of the resulting dry-distilled gas in the presence of air and water vapor,

(f) gasifying the residue from the dry-distillation step with the gas resulting from said burning step,

(g) using the gas resulting from said gasification step in said drying step and said dry-distillation step, and


COOLING AIR
DRY-DISTILLATION GAS
GASES FROM GASIFICATION
RESULTING HOT AIR WILL BE PARTIALLY USED FOR COMBUSTION
AIR FOR PARTIAL COMBUSTION AND WATER VAPOR

(h) discharging the residue in the form of ash resulting from said gasification step, to thereby achieve incineration of the dewatered sludge without an auxiliary fuel.

4,398,477

METHOD FOR GENERATION OF HOT GAS BY INCINERATION OF COMBUSTIBLE MATERIAL AND APPARATUS FOR GENERATION OF HOT GAS BY INCINERATION OF COMBUSTIBLE MATERIAL

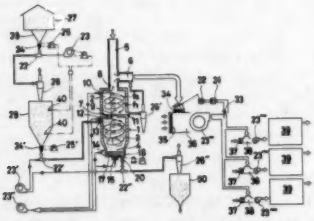
Yosimi Iwasaki, Date, Japan, assignor to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Division of Ser. No. 139,649, Apr. 14, 1980, Pat. No. 4,323,018. This application Oct. 23, 1981, Ser. No. 314,452

Claims priority, application Japan, Jun. 15, 1979, 54-74568

Int. Cl.³ F23G *5/00, 7/00*

U.S. Cl. 110—346 **4 Claims**



1. A method for the incineration of combustible material and the generation of hot gas, which method comprises:

(1) continuously blowing air and combustible material into a lower chamber of a furnace via an inlet opening in an inner wall in an upper section of said lower chamber in a direction tangential to said inner wall of said lower chamber thereby allowing the incoming mixture of air and said material to form a spirally descending current of burning material along said inner wall of said lower chamber and causing said current of burning material to deposit an incandescent residue of combustion toward the bottom of the furnace and give rise to an incandescent layer of ash residue on said furnace bottom,

(2) then causing said current of burning material to reverse its course and rise in a spirally ascending path along the interior of said spirally descending current of burning material, pass through a central opening in a partition wall separating said lower chamber from an upper chamber of said furnace, and enter said upper chamber,

(3) continuously blowing air into said upper chamber via a second inlet opening in said inner wall in an upper section of said upper chamber in a direction tangential to said inner wall of said upper chamber and similar to the direction of air blown into said lower chamber,

causing the incoming air from said second inlet opening to flow in a spirally descending path along said inner wall of said upper chamber and, upon arrival of the descending air flow at the upper surface of said partition wall, allowing part of the air to flow out of said furnace and the greater part thereof to proceed to engulf and entrain said current of burning material having risen from said lower chamber via said opening of said partition wall into said upper chamber and give rise to a spirally ascending current within said upper chamber,

causing a combustible portion still surviving in said current of burning material having entered said upper chamber to burn out and simultaneously causing the dust still entrained by said current of burning material having entered said upper chamber to be discharged out of said furnace in conjunction with the part of air being discharged at the level of said upper surface of said partition wall and,

at the same time, causing a current constituted solely of hot gas to be released into the atmosphere via the ceiling of said upper chamber, and

(4) removing said ash residue via the bottom of said lower chamber at the same rate that said ash residue is produced by the burning of said material so as to maintain constant the thickness of said incandescent layer of ash residue.

4,398,478

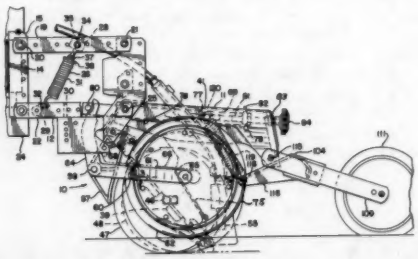
SEED PLANTER APPARATUS WITH COVERING WHEEL

Roland J. Frase, Roselle, and Edward L. Robinson, Jr., Naperville, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Jun. 3, 1981, Ser. No. 270,202

Int. Cl.³ A01C *5/06*

U.S. Cl. 111—85 **8 Claims**



1. A seed planter apparatus comprising:

(a) a frame, said frame being adapted to be connected to a mobile power source for towing;

(b) a pair of opposed furrow-forming disks rotatably mounted on said frame with the disks substantially contacting each other at the approximate point of entry into the soil and diverging apart rearwardly and upwardly relative to the direction of travel;

(c) a seed tube supported from said frame, one end of said tube extending toward the furrow and the other end being adapted for connection to a seed dispenser;

(d) a pair of gauge wheel means individually mounted on said frame for regulating the height of the frame from the soil and thus furrow depth, each gauge wheel means including a support pivotally mounted on said frame and a gauge wheel located in contact with the soil generally adjacent the furrow and an outer surface of each disk and rotatably mounted on said support;

(e) adjustment means for moving said support and said gauge wheels relative to said frame to vary furrow depth; and

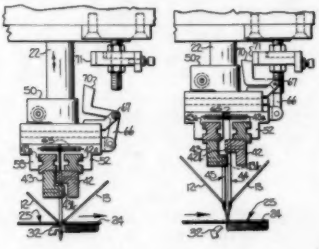
(f) furrow closing and seed soil contact means mounted on said frame, said closing and contact means including an arm structure pivotally mounted on said frame and extending rearwardly to rotatably support furrow closing and seed soil contact structure rearward of said disks to close the soil over the seed, and spring means connected to said frame above said arm structure pivot and to said arm structure below and forward of said pivot, said spring means biasing said arm structure and thus said furrow closing and seed soil contact structure downwardly, and means, including said arm structure and said spring means, for causing the force of the furrow closing and seed soil contact structure on the soil to increase substantially linearly with said furrow depth upon adjustment of said gauge wheels to increase said furrow depth and thus reduce the height of said frame above the soil.

4,398,479

TUFTING MACHINE WITH SHIFTABLE AND INDEXING NEEDLE BARS AND METHOD OF TUFTING

Paul A. Czelusniak, Jr., Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Jun. 26, 1981, Ser. No. 277,965
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R **13 Claims**



1. The combination with a tufting machine having means for advancing a base fabric therethrough, of a pair of first and second elongate needle bars having respective first and second rows of needles thereon normally longitudinally aligned to form a single row of needles with the needles of the rows being in alternation to serve as one needle bar during the tufting operation, means for effecting relative lateral movement to the rows of needles for positioning the rows of needles out of alignment with each other, and means for effecting relative longitudinal movement to the rows of needles while they are out of alignment with each other for changing the order of the needles in the single row to be formed when the needles are moved back into alignment.

4,398,480

FEEDING DEVICE FOR AN AUTOMATIC SEWING ARRANGEMENT

Hans Scholl, Oerlinghausen-Lipperreihe, and Siegfried Vogt, Leopoldshöhe, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 404,986
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134028
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **9 Claims**

1. An automatic sewing arrangement for producing a stitch contour according to a predetermined program, comprising:

a stand;

a sewing head received on said stand, comprising: stitch forming means including

a needle and a plate supporting a workpiece;

propelling means driving said sewing head, and

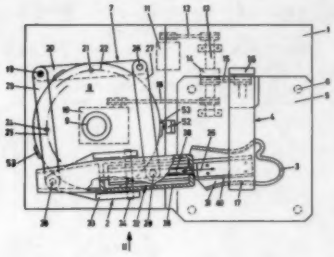
a feeding device for feeding said workpiece with respect to said needle, comprising:

drive elements drivingly connected to said propelling means, including a shaft pivoted in said stand;

a control disc received on said shaft and having two control cams formed correspondingly to said program;

control means controlling the angular relation of said control disc with respect to said stand;

linkage means pivoted at said stand including two drive levers each installed with a cam follower cooperating with said control cams;



holder means supported by said plate for holding said workpieces, and

a drive-off lever operably connected to said drive levers and having receiving means for receiving said holder means,

said receiving means comprising bearing means for displaceably and lockably in at least two positions receiving said holder means,

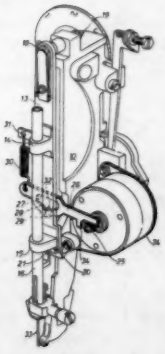
at least one of said control means being associated to each of said positions for interrupting the sewing process at least during a phase of said holder displacement.

4,398,481

ZIGZAG MECHANISM FOR A SEWING MACHINE

Lars-Erik Gustavsson, Frolunda, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Jul. 23, 1981, Ser. No. 285,957
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 R **9 Claims**



1. In a zigzag mechanism for a sewing machine wherein a needle bar holder is mounted to be laterally swingable, a step-

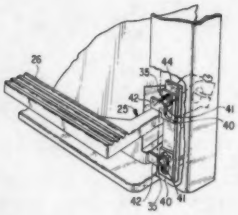
ping motor has a gear, and coupling means are provided between the gear and the needle bar holder to swing the needle bar holder about its swinging axis, thereby to enable zigzag sewing; the improvement wherein said coupling means comprises a first connector means on said needle bar holder elastically coupled to a second connector means engaging said gear, one of said connector means comprising an aperture and the other connector means comprising a pin mounted to elastically engage said aperture.

4,398,482

STITCH LENGTH STOPS FOR INDUSTRIAL SEWING MACHINE

David Forrest, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 23, 1981, Ser. No. 304,740
Int. Cl.³ D05B 27/22
U.S. Cl. 112—316 **1 Claim**



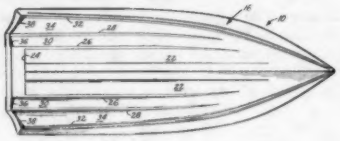
1. An industrial sewing machine comprising a frame including a bed supporting a standard at one end thereof, said standard supporting a bracket arm in overhanging relationship to the said bed, said bracket arm terminating in a head, said head supporting therein a needle bar supported for endwise reciprocation, said needle bar terminating in a sewing needle for cooperation with other sewing instrumentalities supported in said bed in the formation of stitches, said frame supporting a handwheel adjacent said standard, said handwheel having a belt groove therein and being operatively connected to said sewing instrumentaltities including said endwise reciprocating needle bar, said head further supporting a presser bar, said presser bar terminating in a presser foot, said bed supporting therein a reversible feed system for cooperation with said presser foot in feeding a work material beneath said sewing needle for the formation of stitches therein, said standard supporting externally thereof means for influencing a variation in stitch length and in stitch direction, said influencing means including a lever supported by said standard, and shiftable to effect a variation in stitch length and stitch direction, a sheet metal belt guard supported adjacent said standard and about said belt groove in said handwheel, and stop means adjustably carried by said sheet metal belt guard and extending in the path of said lever for limiting the extent of travel thereof, said stop means further comprising a stop member having a finger extending into the path of said lever, a slot extending transversely of said finger and through said stop member, and an external surface parallel to said slot; an aperture in said sheet metal belt guard opening to said slot; a screw extending through said aperture and said slot beyond said stop member; and a bracket positioned adjacent said stop member, said bracket having a tapped aperture receiving said screw, and being formed with an angle for receiving said external surface of said stop member, whereby said stop member is retained perpendicular to said slot in a selected position between said sheet metal belt guard and said bracket.

4,398,483

VEE TYPE PLANING HULL WITH AFT TAPERED WEDGES

Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippen, Ark.

Filed Jul. 20, 1981, Ser. No. 285,021
Int. Cl.³ B63B 1/18
U.S. Cl. 114—56 **4 Claims**



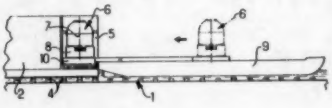
1. A deep vee entry hull having central, intermediate and outboard running surfaces extending fore and aft thereof intermediate the bow and stern; said intermediate running surfaces extending to said stern; said intermediate and outboard running surfaces being smoothly continuous throughout their lengths and terminating at the extreme after ends thereof in wedge means extending across the full widths thereof; and said wedge means being tapered aft.

4,398,484

ARRANGEMENT FOR INSTALLING A NUCLEAR REACTOR BLOCK IN A VESSEL

Robert Pierart, Nantes, France, assignor to Ateliers et Chantiers de Bretagne-ACB, Nantes, France

PCT No. PCT/FR80/00020, § 371 Date Oct. 7, 1980, § 102(e) Date Sep. 22, 1980, PCT Pub. No. WO80/01662, PCT Pub. Date Aug. 21, 1980
PCT Filed Feb. 6, 1980, Ser. No. 212,055
Claims priority, application France, Feb. 7, 1979, 79 03088
Int. Cl.³ B63B 3/00, 5/00, 9/06
U.S. Cl. 114—65 R **3 Claims**



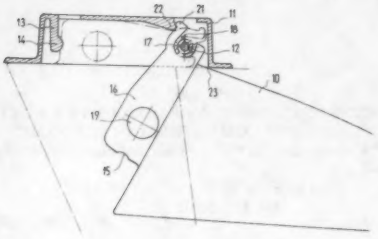
1. An assembly for installing a nuclear reactor block in a vessel, said vessel being built in at least two prefabricated parts which are then assembled end to end, one of the parts including a chamber in which said block may be inserted before said parts are assembled by a substantially horizontal translation movement of said block from a barge by rolling or sliding onto a temporary support situated in said chamber, the improvement wherein said assembly includes hoisting means composed of a plurality of guide columns borne by said one part for guiding the block in a vertical translation movement, jacks provided to the tops of said columns, cables for suspending said block, said cables allowing said block to be raised momentarily to remove the temporary support and to be lowered to make it rest in its final position in said chamber.

4,398,485

DEVICE FOR DETACHABLY SECURING A CENTERBOARD TO A SAILBOARD OR THE LIKE

Bernard Diziere, Cholet, France

Filed Feb. 20, 1981, Ser. No. 236,441
Claims priority, application France, Feb. 22, 1980, 80 04133
Int. Cl.³ B63B *41/00*
U.S. Cl. 114—132 **4 Claims**



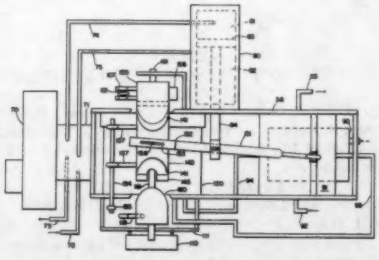
1. A device for detachably mounting a centerboard on a sailboard or the like, said device comprising a casing adapted to be adhesively secured to the sailboard, said casing having an elongated downwardly opening recess therein defining a mortise having front and rear walls and opposing side walls, a peripheral flange surrounding the lowermost end of said recess, said flange being adapted to be seated on the undersurface of the sailboard to provide a bearing surface, a centerboard having a tenon forming portion at its upper end of a size to be fitted in the recess in the casing and a forwardly projecting shoulder adapting to seat on said peripheral flange, said tenon having front and rear ends, a horizontally disposed hinge pin extending between the opposite side walls of the mortise adjacent its rear end and intermediate its top and bottom, said tenon terminating rearwardly in an outwardly opening bore having an opposing pair of resilient lips adapted to be snap-fitted around said hinge pin to permit rearward pivotal movement of said centerboard relative to said mortise, and self-locking attachment means adjacent the front end of said mortise releasably engagable with the front end of said tenon to secure the centerboard in the mortise in its normal position of use, whereby the centerboard may be readily inserted in and removed from the sailboard and pivoted rearwardly about the hinge pin if it strikes an obstruction.

4,398,486

MECHANICAL ACTUATION DEVICE FOR SHIP ROLL STABILIZATION

Dennis A. Woolaver, Rockville, Md., and A. Erich Baitis, Stafford, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1981, Ser. No. 247,485
Int. Cl.³ B63B *39/06*
U.S. Cl. 114—144 R **11 Claims**



1. A mechanical actuation device in a ship having rudders for translating electrical rudder command signals from an electrical actuation device into mechanical control signals for means hydraulically controlling the position of the rudders, comprises:

a hydraulic valve means having a plurality of flow paths and actuated by the electrical rudder command signal to produce a predetermined flow pattern in the flow paths;

a hydraulic actuator connected to the flow paths, the hydraulic actuator having a hydraulic chamber with a movable piston disposed therein for movement in response to fluid flow patterns in the flow paths, wherein the mechanical impulse produced by the hydraulic actuator is proportional to the electrical rudder command signal; and

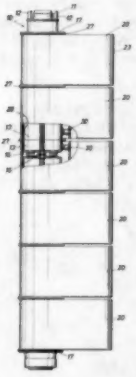
a mechanical coupling means including a coupling element connected to the movable piston of the hydraulic actuator, a bearing member connected to the means hydraulically controlling the position of the rudders, and switch means connected to the bearing member for shifting the bearing member to engage the coupling element upon activation of the switch means and for disengaging the bearing member from the coupling element upon deactivation of the switch means.

4,398,487

FAIRING FOR ELONGATED ELEMENTS

John E. Ortloff; Matthew N. Greer, and Terry N. Gardner, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Jun. 26, 1981, Ser. No. 277,773
Int. Cl.³ E21B *33/035*
U.S. Cl. 114—243 **3 Claims**



1. A fairing for a marine drilling riser having a plurality of pipes and a flotation assembly for use about the pipes wherein the flotation assembly comprises semi-annular flotation modules made of a buoyant material having a convex non-uniform outer surface and clamping means for holding said flotation modules about the pipes, said fairing comprising:

a body of substantially rigid material forming a streamlined symmetrical structure having a nose portion, a tail portion, and two opposed side portions, said nose portion having an opening along its axis to accommodate said pipes and flotation assembly,

spring means formed of a flexible material, said spring means having opposed first and second ends, said first end being fixedly attached to the nose portion of said body and said second end extending to a position located on the downcurrent side of and proximate to said flotation modules, the inner surface of said spring means being concave to generally conform to the convex outer surface of said flotation modules, and

bearings connected to the inner surface of said spring means,

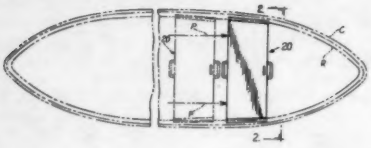
said spring means being configured and positioned such that positioning of said riser in said fairing body opening forces said spring means second end in a down-current direction away from its unrestrained position whereby said bearings are biased against said flotation modules.

4,398,488

REMOVABLE CANOE-CARRIED COOLER

Kenneth G. Mathieu, 33980 Oakdale, Livonia, Mich. 48154

Filed Sep. 21, 1981, Ser. No. 304,120
Int. Cl.³ B63B *17/00*
U.S. Cl. 114—343 **6 Claims**



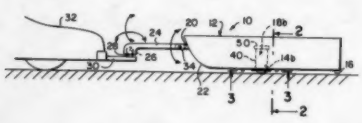
1. A removable canoe-carried cooler for a canoe having an interior perimeter top rim, said canoe-carried cooler having an insulated container portion, an insulated hinged lid therefor, and a lock for the lid, said canoe-carried cooler constructed to be fitted into a canoe and to be removed therefrom at will, the construction of said canoe-carried cooler being such that when it is inserted in said canoe and pulled toward an end thereof it wedges and locks itself in place therein, said canoe-carried cooler having tapered side walls which are wider at one end than at the other so that as the canoe-carried cooler is pulled toward an end of the canoe widthwise wedging thereof occurs in the canoe, the canoe-carried cooler having rail means formed along the side walls thereof which engage said rim as the canoe-carried cooler is pulled toward an end of said canoe.

4,398,489

BUILT-IN TRAILER FOR BOATS

Salvatore Feola, 2 N. Robert Damn St., Bethpage, N.Y. 11714

Filed Jan. 12, 1982, Ser. No. 338,894
Int. Cl.³ B63C *13/00*
U.S. Cl. 114—344 **2 Claims**



1. A built-in trailer for boats which comprises:

(a) a boat having a pair of apertures at a medial point on the underside of said boat;

(b) a pair of retractable wheel assemblies mounted within said pair of apertures at said medial points on said underside of said boat wherein each of said retractable wheel assembly comprises a housing having a bottom aperture and a top aperture, a wheel with axle slidably mounted within said bottom aperture of said housing, a means for raising and lowering said wheel comprising a pair of tracks each having an elongated vertical slot, a set of short horizontal transverse top slots and a set of short horizontal transverse bottom slots said tracks mounted vertically within said housing, a pair of arms each slidably placed within each of said tracks each arm engaging said axle of said wheel, a means for raising and lowering and locking said pair of arms and a watertight cover that fits over said top aperture of said housing; and

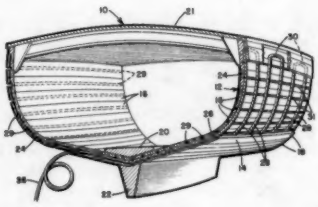
(c) a means for coupling said boat to a hitch on a motor vehicle comprising a stationary arm with one end mounted to the bow of said boat and the other end having a transverse aperture, a coupler arm with one end having a hollow cap to engage a hitch ball of said hitch on said motor vehicle to allow the horizontal movement and the other end having a transverse aperture, and a pin placed through said transverse aperture of said stationary arm and through said transverse aperture of said coupler arm to allow for vertical movement.

4,398,490

STRUCTURAL ELEMENT, IN PARTICULAR A BOAT HULL, AND METHOD OF MAKING THE SAME

Edmund A. Cutts, Oxford, Md., assignor to Cascut Corporation, Oxford, Md.

Filed Mar. 30, 1981, Ser. No. 248,851
Int. Cl.³ B63B *5/02*
U.S. Cl. 114—358 **25 Claims**



20. A wooden boat hull comprised of an inner layer formed of plurality of first wood planks extending in the longitudinal direction of said hull and arranged one above another into the general shape of the hull, a single continuous groove formed in the outer surface of said wood planks, said groove extending in a zigzag pattern across the planks between opposite uppermost first wood planks and from fore to aft, a cord fitted into said groove and an adhesive applied to and penetrating within the groove, into the interior of the cord and within the pores of the wood surrounding said groove to thereby bond said first planks to one another, and an outer layer of second wood planks extending in substantially the same longitudinal direction as said first wood planks, said second wood planks being attached to the outer surface of said first wood planks whereby the entire structural integrity of said hull is provided by the bonding of said first plank to one another by said cord and adhesive and the attachment of said outer layer of second wood planks.

4,398,491

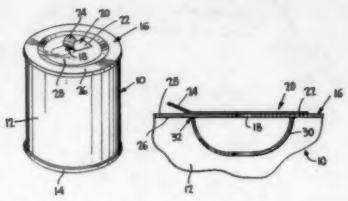
ACOUSTIC INDICATOR OF VACUUM LEVEL IN CONTAINERS

James J. Fridl, Darien; Heinz W. Nonnemann, Palos Park; Robert D. Payne, Countryside, and Wesley J. Szpitalak, Palos Park, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Jun. 3, 1981, Ser. No. 270,066
Int. Cl.³ G08B *3/00*; B65D *51/24*; G10K *5/00*
U.S. Cl. 116—67 R **9 Claims**

1. An end unit attached to a vacuum pack container, said end unit including a flat panel portion with an opening therethrough, vacuum indicating means in the form of a whistle

device on the underside of said flat panel portion in communication with said opening, and a removable closure secured to



an upper side of said flat panel and normally closing said opening.

4,398,492

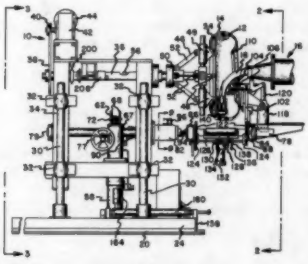
APPARATUS FOR APPLYING AN EXTRUDED STRIP TO AN INSIDE TIRE SURFACE

William R. Casey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 23, 1981, Ser. No. 323,935

Int. Cl.³ B60C *21/08;* B05B *13/06*

U.S. Cl. 118—105 **17 Claims**



1. Apparatus for applying a layer of extruded material to an inside surface of a tire from an extruder having a stationary extruder die for extruding a strip of said material comprising means for gripping a first bead portion of said tire, tire positioning means for moving the gripped tire into an operating position with said extruder die in close proximity to said inside surface of said tire, means for rotating said tire to lay said strip of said material on said inside surface in one turn as it is extruded from said extruder die, means for providing axial movement of said tire relative to said extruder die to lay additional turns of said strip in side-by-side relationship around said inside surface to form said layer or extruded material and said tire positioning means being reversible for moving the tire away from said extruder die so that the finished tire can be released and removed from the apparatus.

4,398,493

COATING OF SOLIDS

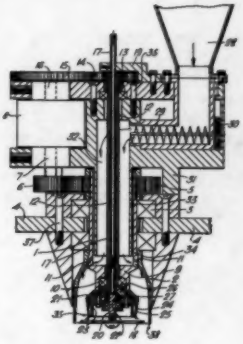
John E. Gillett, Gawsworth; John Isherwood, Congleton; Richard A. Hann, Frodsham, all of England; Philip Norton-Berry, Llandegla, Wales, and Margaret L. Steel, Runcorn, England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 120,328, Feb. 11, 1980, Pat. No. 4,318,941. This application Dec. 3, 1981, Ser. No. 327,099

Claims priority, application United Kingdom, Feb. 21, 1979, 7906082

Int. Cl.³ B05B *17/00*

U.S. Cl. 118—303 **4 Claims**



1. A device suitable for coating particulate solid materials, comprising a body rotatable about an axis and having a surface of rotation facing towards the axis and said surface has a concavity in the axial direction, means to supply solid particulate material to a supply zone on the said surface of rotation, means to rotate the body to thereby cause the particulate material to travel across the surface of rotation from the supply zone to a discharge zone axially remote from the supply zone, a member adapted to rotate independently of the body and mounted coaxially with the said surface of rotation of the body, and means to feed coating material to a second surface being a surface on the member, the second surface being positioned adjacent to at least a part of said surface of rotation so as to contact the particulate material as the latter travels across said part of the surface of rotation to thereby transfer the coating material to the particulate material when the member is rotating.

4,398,494

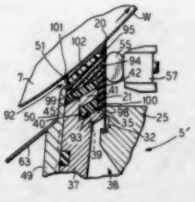
END DAM SEAL FOR BLADE TYPE FOUNTAIN COATERS

Robert J. Alheid, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 2, 1982, Ser. No. 344,997

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—410 **20 Claims**



1. In a fountain coating applicator especially suitable for

paper web coating and including a doctor blade projecting generally upwardly toward backing surface means, and having an upper edge for coating nip relation across the width of a web travelling continuously on said backing surface means; and means extending across at least the width of the web for supplying coating material under hydraulic pressure to said coating nip and including a coating application chamber defined in part by said doctor blade and said backing surface means, and in addition by an application chamber surface area spaced substantially below said nip, the improvement comprising:

end dam sealing means for at least one end of said application chamber, and adapted for engaging sealingly with said chamber surface area, said blade and said backing surface means;

said end dam sealing means comprising a closed cell elastomer body having a sealing surface sealingly engageable with said blade;

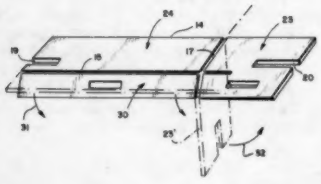
and a wear resistant solid plastic sealing surface layer of substantial thickness carried by said body and having a face engageable with said backing surface means, said face having channel means therein between sealing surface land means for draining coating material migrating from said application chamber between said sealing means and said backing surface means.

4,398,495

PAINT SHIELD

Louis W. Harris, Jr., 10225 Sunland Blvd., Sunland, Calif. 91040, and Michael T. Harris, 7908 Quimby Ave., Canoga Park, Calif. 91304

Filed Apr. 2, 1982, Ser. No. 364,805
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—504 **3 Claims**



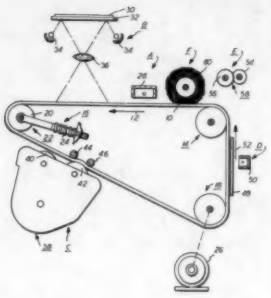
1. A paint shield comprising a thin rectangular sheet having a longitudinal crease extending in from one end past the midpoint of said shield and terminating short of the opposite end, and a transverse crease extending from one longitudinal edge to the other, said transverse crease crossing said longitudinal crease so that the terminal end of said longitudinal crease lies between said transverse crease and said opposite end, said shield further including two longitudinally spaced cut-outs adjacent one longitudinal edge of the shield to serve as handles to facilitate holding the shield, said transverse crease passing between said cut-outs, whereby the portion of said shield to one side of said transverse crease can be easily bent about said transverse crease, out of the plane of the remaining portion of the shield to facilitate shielding areas that intersect at an angle, and whereby the bent portion of the shield can be easily and automatically snapped back to its coplanar relationship with the remaining portion of the shield by flexing the shield about said longitudinal crease.

4,398,496

MULTI-ROLL DEVELOPMENT SYSTEM

John J. Kopko, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 16, 1982, Ser. No. 399,064
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—658 **30 Claims**



1. An apparatus for developing a latent image recorded on a flexible member, including:

first means, positioned closely adjacent to the flexible member defining a first development zone therebetween, for transporting a developer material into contact with the flexible member in the first development zone so as to optimize development of lines in the latent image;

second means, spaced from said first transporting means and positioned closely adjacent to the flexible member defining a second development zone therebetween, for transporting the developer material into contact with the flexible member in the second development zone to optimize development of solid areas in the latent image; and

means for maintaining the flexible member, in the region of at least the second developement zone, at a preselected tension of sufficient magnitude so that the developer material being transported into contact with the flexible member in at least the second development zone is compressed and deflects the flexible member about at least said second transporting means.

4,398,497

LIQUID ELECTROPHOTOGRAPHIC TONER APPLICATOR

Josef Matkan, Malvern, Australia, assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Jun. 22, 1981, Ser. No. 275,868
Claims priority, application Australia, Jun. 25, 1980, PE4198
Int. Cl.³ G03G *15/10*
U.S. Cl. 118—661 **15 Claims**

1. The method for the application of liquid dispersed toner to the surface of an electrographic recording member consisting in the steps of

(a) positioning said electrographic recording member on a flat platen support member arranged for relative movement over at least a pair of spaced-apart coplanar developing electrodes which form with the said platen member a developer gap

(b) providing a flow of liquid dispersed toner to the space between the two said spaced-apart developing electrodes and directing the flow of the said toner outwards over either the one or the other said developing electrodes to flow through the said developer gap and

(c) alternately changing the direction of flow of the said toner in the said developer gap while changing the relative direction of movement of the said platen member in relation to the said developer electrodes.

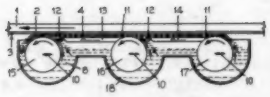
5. The method for the application of liquid dispersed toner to the surface of an electrographic recording member as defined in claim 1 consisting of the steps of

positioning said electrographic recording member on a flat platen support member arranged to traverse across two planar developing electrodes spaced apart from and below said flat platen,

providing at least one supply roller in proximity to said planar developing electrodes, said at least one supply roller being mounted in adjustable relationship to said planar developing electrodes,

moving said at least one supply roller into proximity with one planar developing electrode,

rotating said at least one supply roller to lift liquid dispersed toner to flow over said planar developing electrode,



moving said platen in the same direction as said toner flow over said planar developing electrode to contact said toner incrementally with said electrographic recording member,

traversing said platen in said direction across said planar developing electrodes,

moving said at least one supply roller into proximity with the other planar developing electrode,

rotating said at least one supply roller in the opposite direction to cause toner flow in the reverse direction across said planar developing electrode in proximity thereto, and

moving said platen containing said electrographic recording member thereon across said planar developing electrodes in said opposite direction.

4,398,498

EXPOSURE CHAMBER

Owen R. Moss, Kennewick, and James K. Briant, Pasco, both of Wash., assignors to Hazleton Systems, Inc., Aberdeen, Md.

Filed Jan. 4, 1982, Ser. No. 336,670

Int. Cl.³ A01K *1/03*

U.S. Cl. 119—15 **7 Claims**

1. A fluid treatment chamber comprising:

a. imperforate substantially vertical front, rear, and side walls and closed upper and lower ends;

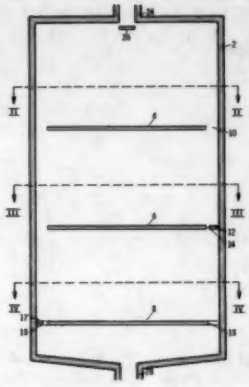
b. a fluid inlet in one of said ends;

c. a fluid outlet in the other of said ends;

d. an inlet deflector adjacent said inlet constructed and arranged to deflect fluid introduced at said inlet towards said substantially vertical walls;

e. a plurality of imperforate substantially horizontal pans within said chamber, each of said pans, other than that most remote from said inlet, being spaced from said vertical walls by distances which are sufficient to permit flow of fluid along said walls sufficient to supply fluid to pans downstream of it; but which are small compared to the horizontal dimensions of said pans, said pans otherwise occupying the entire cross sectional area of said chamber;

f. means constructed and arranged to prevent substantial flow of fluid between said vertical walls and said pan most remote from said inlet except for an area adjacent a centerplane of said chamber, said means being constructed and



arranged to provide open spaces on opposite sides of said pan, said spaces having materially different areas.

4,398,499

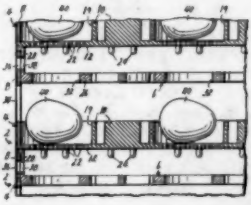
POULTRY INCUBATION AND HATCHING TRAY

John R. Blakely, Rte. 2-Box 17HH, Ahoskie, N.C. 27910

Filed Apr. 7, 1982, Ser. No. 366,144

Int. Cl.³ A01K *41/00*

U.S. Cl. 119—43 **11 Claims**



1. A poultry incubation and hatching tray adapted to be tiltably inverted from a horizontal incubation position to a horizontal hatching position, and to be tilted, alternately in opposite directions from horizontal when in its incubation position, and to be stacked with other identical trays, said tray comprising:

a. a body member having, when in its hatching position, a horizontal floor and upstanding side and end walls,

b. a cover member releasably joined to said body member and having a wall parallel to but spaced apart from the floor of said body member, and

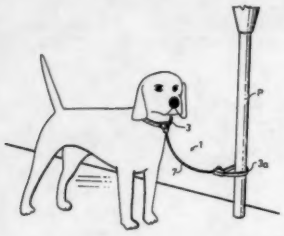
c. egg support members formed by special configurations of said body member and cover to constitute a series of individual compartments each operable to contain a single poultry egg, each of said compartments being configurated, when the tray is in its incubation position, to maintain its associated egg in a position with its axis substantially vertical, and substantially stationary relative to said tray, and when the tray is inverted to its hatching position, to allow said egg to move by gravity to a position lying on its side on said floor, with a degree of free rolling movement on said floor.

4,398,500

LOCKING ANIMAL COLLAR

Henry L. Koronkiewicz, 186 Queens Ave., Toronto, Ontario, Canada M8V 2N9

Filed Feb. 23, 1982, Ser. No. 351,525
Int. Cl.³ A01K 27/00
U.S. Cl. 119—109 14 Claims



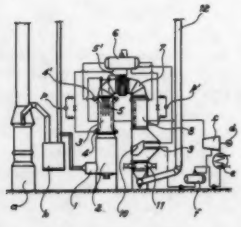
1. An animal leash having first and second deformable loop forming portions at either end thereof, said first loop forming portion comprising a collar which is adjustable to different loop sizes, a locking arrangement for locking said collar at the different loop sizes, said locking arrangement comprising adjustment recesses in said collar, a housing for slideably receiving said collar, lug means within said housing for fitting into said recesses when the collar is locked, and a rotatable lock member moveable from a locking position for forcing the fitting of said lug means into said recesses to an unlocking position for withdrawal of said lug means from said recesses to allow adjustment of said collar; and locking means to additionally and releasably lock said second loop forming portion for opening and closing thereof to secure an animal locked in said collar portion to a post and the like.

4,398,501

SYSTEM FOR RECOVERING LATENT AND SENSIBLE HEAT OF EFFLUENT GASES FROM A MELTING INSTALLATION

Mario Mischiatti, Como, Italy, assignor to Costruzioni Meccaniche F.B.M.S.p.A. and Teksid S.p.A., both of, Italy

Filed Jul. 16, 1981, Ser. No. 283,880
Claims priority, application Italy, Jul. 24, 1980, 23682 A/80
Int. Cl.³ F22D 1/00
U.S. Cl. 122—7 R 14 Claims



1. System for recovering latent and sensible heat of effluent gases from a cupola for cast iron production or from other similar melting installation consequent intermittent operation thereof, for obtaining heat energy or potential electric energy in the form of hot water and/or steam, which comprises a thermal unit and a superheater for producing superheated steam capable of converting the heat energy into electric energy,

the thermal unit including a combustion air burner and a combustion chamber arranged for burning such effluent gases with combustion air to form hot combustion gases therefrom,

two vertical waste heat boilers arranged for independent heat recovery operation and disposed in series along a flow path successively downstream of the burner and combustion chamber for receiving in turn the hot combustion gases from the combustion chamber, the first of said boilers being of the water tube type having vertically arranged water tubes and the second of said boilers being of the fire tube type having vertically arranged fire tubes, and the flow path having a first vertical flow portion containing such water tubes, a second vertical flow portion containing such fire tubes and an intermediate upper interconnecting transitional reverse flow portion between the first and second vertical flow portions for thereby permitting the hot combustion gases flowing along the flow path through the two boilers to flow in an upward direction from bottom to top in the water tube boiler so as to lick the water tubes thereof, thence through the upper interconnecting reverse flow portion and in turn to flow in a downward direction from top to bottom in the fire tube boiler so as to enhance the self-cleaning of the fire tubes thereof, and

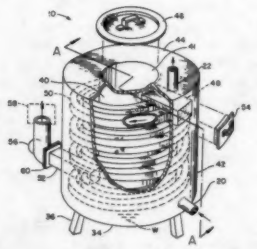
a common external steam separator installed above the two boilers and in remote spaced relation to the flow path and operatively respectively connected to the two boilers for correspondingly receiving steam therefrom and returning water thereto.

4,398,502

WATER HEATER WITH UP-DOWN FLOW FLUE

Ki D. Park, 1424-3 3KU, Sankyuk Dong, Buk-Ku, Taegu, Rep. of Korea

Filed Mar. 9, 1981, Ser. No. 241,621
Claims priority, application Rep. of Korea, Jul. 28, 1980, 4799
Int. Cl.³ F22B 5/00
U.S. Cl. 122—17 8 Claims



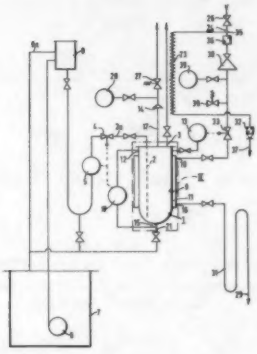
1. An improved system for heating a fluid such as water, of the type having: a casing with entrance and egress for water held therein for heating, a burner, a flue system including: an upright flue in the casing as heat exchanging means, a combustion chamber at the lower end of the upright flue and connecting therethrough with fume exhaust means, wherein the fume exhaust means extends downward through the casing as downdraft heat exchanging means, means connecting with the lower end of the downdraft heat exchanging means for drawing fumes downward out of the flue system, said downdraft heat exchanging means comprising a plurality of tubes connected to have respectively parallel flow paths therethrough, said extension downward being a substantially helical extension, the upright flue having an open bottom, a removable closure covering the top of the upright flue, providing access for inspection and cleanout, and an entrance header forming a first chamber between the upright flue and the downdraft heat exchanging means and connecting radially to the upright flue and circumferentially to said plurality of tubes of the downdraft heat exchanging means.

4,398,503

METHOD AND APPARATUS FOR METERING A FEED OF HYDROGEN FLUORIDE VAPOR

George M. Gillies, St. Annes, England, assignor to British Nuclear Fuels Limited, Warrington, England

Division of Ser. No. 168,011, Jul. 14, 1980, Pat. No. 4,346,673.
This application Sep. 17, 1981, Ser. No. 303,114
Claims priority, application United Kingdom, Jul. 23, 1979, 7925564
Int. Cl.³ F22B 1/02
U.S. Cl. 122—31 R 1 Claim



1. A method of producing a metered feed of hydrogen fluoride vapour comprising the steps of

(a) metering a flow of liquid hydrogen fluoride,

(b) introducing the metered flow continuously into liquid hydrogen fluoride contained in a boiler having a heat transfer surface arranged to be increasingly covered by the liquid hydrogen fluoride as the level of the liquid hydrogen fluoride rises in the boiler,

(c) supplying heat to the heat transfer surface continuously in a manner to effect evaporation of the liquid hydrogen fluoride at a rate determined essentially only by the amount of the heat transfer surface covered by the liquid hydrogen fluoride, the heat being supplied to the heat transfer surface by condensing steam out of contact with the hydrogen fluoride,

(d) controlling the metered flow rate within limits set by the size and location of the heat transfer surface for the automatic balance in equilibrium of the rate of evaporation and the metered flow rate with the heat transfer surface always partially covered, and

(e) removing hydrogen fluoride vapour through an outlet from the boiler substantially continuously at the rate of evaporation.

4,398,504

STEAM GENERATING HEAT EXCHANGER

Andrew F. Kwasnik, Jr., Ellington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 114,472, Jan. 23, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 312,037
Int. Cl.³ F22G 3/00
U.S. Cl. 122—468 3 Claims

1. A steam generating heat exchanger for cooling a high pressure, hot gas, comprising:

a. a first vertically elongated cylindrical pressure containment vessel having a gas inlet at one end thereof and a gas outlet at the opposite end thereof;

b. a second vertically elongated cylindrical pressure containment vessel having a gas inlet at one end thereof and a gas outlet at the opposite end thereof;

c. a pressure containment pipe connecting the gas inlet of said second pressure containment vessel to the gas outlet of said first pressure containment vessel;

d. a first inlet header disposed within said first pressure containment vessel at the bottom thereof;

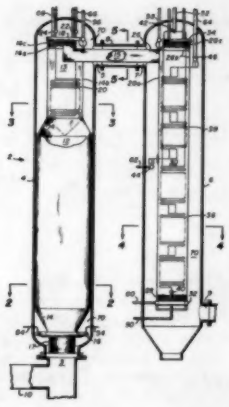
e. a first outlet header disposed within said first pressure containment vessel at the top thereof;

f. a second inlet header disposed within said second pressure containment vessel at the top thereof;

g. a second outlet header disposed within said second pressure containment vessel at the bottom thereof;

h. a radiant cooling chamber disposed within said first pressure containment vessel so as to establish a gas pass extending therethrough from the gas inlet to the gas outlet thereof, said radiant cooling chamber formed of a plurality of steam generating heat exchange tubes arranged side-by-side with a first portion of the tubes extending vertically from said first inlet header to said first outlet header thereby establishing a first fluid circuit and with a second portion of the tubes extending vertically from said first inlet header to said second outlet header thereby establishing a second fluid circuit;

i. a convective cooling chamber disposed within said second pressure containment vessel so as to establish a gas pass extending therethrough from the gas inlet to the gas outlet thereof, said convective cooling chamber formed of a



plurality of steam generating heat exchange tubes arranged side-by-side with a first portion of the tubes extending vertically from said second inlet header to said second outlet header thereby establishing a third fluid circuit to said second outlet header and with a second portion of the tubes extending vertically from said second inlet header to said first outlet header thereby establishing a fourth fluid circuit;

j. a cooled connector duct disposed within said pressure containment pipe so as to establish a gas pass extending therethrough from the radiant cooling chamber disposed within said first pressure containment vessel to the convective cooling chamber disposed within said second pressure containment vessel, said connector duct formed in part by the second portion of the steam generating heat exchange tubes forming the radiant cooling chamber and in part by the second portion of the steam generating heat exchange tubes forming the convective cooling chamber;

k. at least one convective heat exchanger disposed in the gas pass within the convective cooling chamber of said second pressure containment vessel;

l. means for supplying cooling water to said first inlet header;

m. means for supplying cooling water to said second inlet header;

n. means for removing hot water and steam from said first outlet header; and

o. means for removing hot water and steam from said second outlet header.

4,398,505

DIESEL FUEL COMPOSITION

Paul J. Cahill, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 22, 1981, Ser. No. 313,799
Int. Cl.³ F02B *75/12;* **C10C** *1/22*
U.S. Cl. 123—1 A **20 Claims**

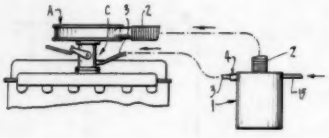
1. A diesel fuel composition comprising a liquid hydrocarbon fuel of diesel fuel boiling range in combination with an N,N-disubstituted organic nitroxide wherein the amount of said nitroxide is from about 0.3 to about 2 weight percent of said composition.

4,398,506

SYSTEM FOR IMPROVING COMBUSTION EFFICIENCY

Thomas M. Cosway, 124 Caroline St., South Yarra, Victoria 3141, Australia

Filed Feb. 19, 1981, Ser. No. 235,976
Claims priority, application Australia, Feb. 21, 1980, PE2472
Int. Cl.³ F02D *19/00*
U.S. Cl. 123—25 L **8 Claims**



1. A system for improving the combustion efficiency of an internal combustion engine having means supplying fuel and primary air for combustion in said engine and a valve for controlling the flow of at least said primary air into said engine, said system including means for introducing a liquid in fine particle or vapour form into said primary air stream, means for drawing air treated by said liquid introducing means into said primary air stream at a position down stream of the primary air controlling valve of said engine, and valve means for controlling the flow of said treated air in response to the level of vacuum produced by said engine whereby said valve means is closed when the engine is idling and is open when the engine is operating at a speed above the idling speed.

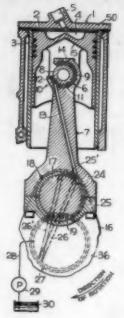
4,398,507

CONNECTING ROD SPRAY ORIFICE FOR COOLING OF A PISTON

James F. Belsanti, Blue Island, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 23, 1981, Ser. No. 314,132
Int. Cl.³ F01P *3/06*
U.S. Cl. 123—41.38 **13 Claims**

1. A hydraulic fluid cooling system for an internal combustion engine comprising, a source of pressurized fluid, a crankshaft having passage means connected to said source of pressurized fluid, a connecting rod having passage means connected to said passage means in said crankshaft, a piston, a wrist pin bearing connecting said piston to said connecting rod, an orifice means on said wrist pin bearing connected to said passage means in said connecting rod, said orifice means on said wrist pin bearing including a shorter axial length dimension than the cross-sectional dimension across the orifice



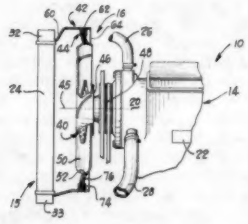
thereby providing a widely diverging spray on the underside of said piston.

4,398,508

ENGINE COOLING FAN CONSTRUCTION

Charles L. Moon, and Joseph T. Cieszko, both of Richmond Heights, Ohio, assignors to Volvo White Truck Corporation, Greensboro, N.C.

Filed Feb. 20, 1981, Ser. No. 236,590
Int. Cl.³ F01P *5/06*
U.S. Cl. 123—41.49 **16 Claims**



1. A fan assembly including:

a fan member supported for rotation about an axis;

a tubular shroud member surrounding and spaced radially outwardly from the fan member, the members defining a clearance therebetween;

a flexible seal disposed in the clearance and fixed to one of the members, the other member when in use being in continuous contact with the seal.

4,398,509

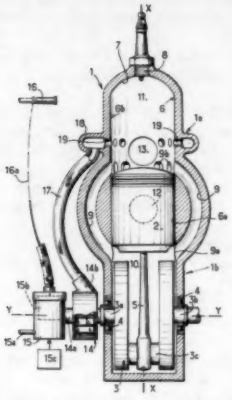
TWO-STROKE MOTOR

Eric Offenstadt, Pontoise, and Bernard Houze, Neuilly, both of France, assignors to Sercati, Paris, France

Filed Dec. 1, 1980, Ser. No. 211,973
Claims priority, application France, Dec. 3, 1979, 79 29648
Int. Cl.³ F02B *1/08, 33/04*
U.S. Cl. 123—73 CC **11 Claims**

1. A two-stroke motor comprising a case defining a generally cylindrical upper cavity and a lower cavity, a piston slidably mounted in said upper cavity, a crankshaft disposed in said lower cavity, means connecting said crankshaft to said piston, carburetted gas supply means for supplying carburetted gas, non-carburetted gas supply means for supplying non-carburetted gas, at least one of said gas supply means including said lower cavity, and transfer conduit means for transferring gas

from said lower cavity to said upper cavity, said lower cavity providing crankcase compressor means for compressing the gas supplied, said upper cavity presenting an exhaust port by which burnt gas is exhausted, said exhaust port having an upper edge, a first set of intake ports spaced apart angularly around said upper cavity and through which said non-carburetted gas supply means communicates with said upper cavity and a second set of intake ports spaced apart angularly around



said upper cavity and through which said carburetted gas supply means communicates with said upper cavity, the intake ports of said first set presenting upper edges disposed below said upper edge of said exhaust port, and one of said sets of intake ports being disposed above the other set, said gas supply means being arranged to commence supplying non-carburetted gas to scavenge said upper cavity after said exhaust port is uncovered by said piston and before supplying carburetted gas to said upper cavity.

4,398,510

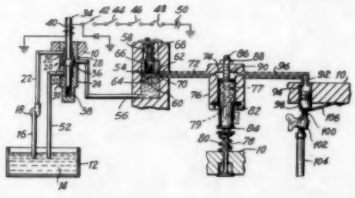
TIMING MECHANISM FOR ENGINE BRAKE

Dennis R. Custer, West Granby, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 958,119, Nov. 6, 1978, abandoned. This application Mar. 27, 1981, Ser. No. 248,344

Int. Cl.³ F02D *13/04*

U.S. Cl. 123—90.16 **12 Claims**



1. In an engine braking system of a gas compression release type including a combustion engine having exhaust valve means, hydraulically actuated reciprocating first piston means associated with said exhaust valve means to open said exhaust valve means at a predetermined time, and means for applying hydraulic pressure fluid to one end of said first piston means, the improvement comprising a timing means including body means adjustably positioned within said engine so as to locate one end of said body means to provide a first predetermined clearance in said exhaust valve means when said first piston means is in contact with said body means and said exhaust valve means are in a fully closed position, said body means having a cavity formed therein, second piston means having first and second ends and closely fitted for reciprocating movement with respect to said cavity of said body means between a first position in which said second piston means is located entirely within said cavity and a second position in which said second end of said second piston means extends outwardly a predetermined distance from said one end of said body means, said first end of said second piston means defining a closure for said cavity in said body means, said second end of said second piston means adapted to provide, in its second position, a second predetermined clearance in said exhaust valve means whenever said means for applying hydraulic pressure fluid is actuated, check valve means communicating between said cavity of said body means and said one end of said body means whereby said hydraulic fluid is directed into said cavity whenever the hydraulic pressure on said first piston exceeds the hydralic pressure in said cavity and spring means biasing said second piston means toward said one end of said body means.

4,398,511

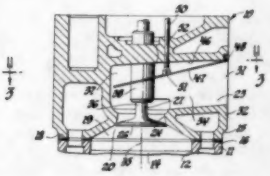
ADJUSTABLE ROOF ENGINE SWIRL INLET PORT

John E. Nemazi, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1981, Ser. No. 295,798

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—188 M **5 Claims**



1. An internal combustion engine including means defining a cylinder and an inlet port communicating with the cylinder, said port having

a throat opening to the cylinder,

a poppet valve having a stem and head controlling the throat opening and having an axis extending through the throat,

a swirl portion connecting with the throat and curved about the valve axis upstream of the throat,

an entrance portion connecting with the swirl portion and extending upstream generally tangentially from a point adjacent the valve axis, and

a movable wall lying generally opposite the throat and comprising a ceiling extending at least partially about the valve stem and over a substantial part of the port swirl portion and defining over its extent an upper bound of the port flow area, said wall being movable, at least in the swirl portion of the port, between positions axially nearer to and farther from the throat to vary the port height along adjacent portions of the path of gas flow and thereby vary the rate of gas flow through the various portions of the throat and the resulting level of charge swirl created in the cylinder.

4,398,512

INTERNAL COMBUSTION ENGINES AND ROTARY VOLUMETRIC COMPRESSORS

Agustin M. Parma, Luis Alberto De Herrana 2641, Montevideo, Uruguay

Filed Aug. 11, 1980, Ser. No. 177,101

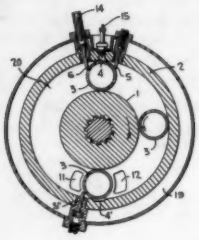
Claims priority, application Uruguay, Aug. 23, 1979, 20937

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—245 **6 Claims**

1. In a rotary fluid displacement mechanism having a rotor which is driven and being provided with an intake port and an

exhaust port, the improvement comprising a hollow cylindrical casing in which said ports are located in close proximity to each other, a cylindrical rotor concentrically mounted within said casing to provide a cylindrical annulus between the rotor and casing, end caps sealingly engaging the ends of said casing, at least two cylindrical rollers within said annulus compressed between the rotor and inner surface of the casing so that rotation of the rotor drives each roller in a circular revolution through the annulus, means to releasably retain said rollers intermittently one at a time while the other is free to revolve, said releasable retaining means being located between the intake and exhaust ports to provide two simultaneously variable chambers in the annulus between the rollers, a shaft disposed concentrically within said rotor on which said rotor is



mounted, bearing means in said end caps for mounting said shaft for rotation and said rotor comprising a radially expandable cylinder, a conical seat near each end of and within said cylinder the larger diameter of which is nearer the end, a conical wedge member within each seat in cooperative engagement therewith and slidably mounted on said shaft, a helical spring mounted on said shaft between the base of each wedge member and the respective end of said cylinder to resiliently urge said wedge members towards the center of said cylinder to thereby produce a radially expanding force on said cylinder, and a sliding splined connection between said shaft and said cylinder and between said conical seats, said splined connection having radial clearance between said shaft and rotor to facilitate providing a radial resilient force on said rollers.

4,398,513

INTERNAL COMBUSTION ENGINE

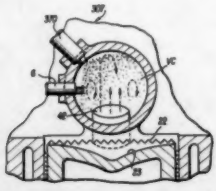
Yasusi Tanasawa; Tadakuni Hayashi, both of Nagoya, and Norio Muto, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 28, 1980, Ser. No. 115,888

Claims priority, application Japan, Feb. 30, 1979, 54-10758; Feb. 30, 1979, 54-10759

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—255 **9 Claims**



1. An internal combustion engine comprising:

a piston reciprocally movable within a cylinder for affording the rotational motions to a crankshaft;

a combustion chamber formed among said piston, said cylinder and a cylinder head;

an intake valve mechanism for opening and closing an intake passage to be communicated with said combustion chamber;

igniting means having its igniting portion facing said combustion chamber;

at least one evaporation portion formed of a predetermined wall of said combustion chamber within said combustion chamber and heated to a predetermined high temperature by the combustion in said combustion chamber;

fuel supply means for supplying a predetermined quantity of fuel toward said evaporation portion in said combustion chamber; and

an exhaust valve mechanism for opening and closing an exhaust passage to be communicated with said combustion chamber;

whereby the fuel is brought by said fuel supply means, during the running operation, into contact with said evaporation portion of said combustion chamber, said fuel being evaporated from the surface of said evaporation portion, so that the gasification of the fuel is promoted to effect combustion with high efficiency and to prevent emission of unburned noxious contents such as hydrocarbons; and

wherein said combustion chamber comprises:

a first combustion chamber formed within said cylinder head;

a second combustion chamber communicated with said first combustion chamber through a tangential communication port; and

said fuel supply means have a supply port arranged in a predetermined position of an inner wall of said first combustion chamber, thereby supplying the fuel to a substantially wide area of an inner wall of said first combustion chamber so that the supplied fuel may be evaporated from the surface of said inner wall of said first combustion chamber;

wherein said piston has a recess arranged in the vicinity of said tangential communication port and a plurality of V-shaped recesses provided in parallel to the axis of said communication port and connected to said recess and forming a large surface area portion.

4,398,514

SYSTEM FOR CONTROLLING NO LOAD OPERATION OF INTERNAL COMBUSTION ENGINE

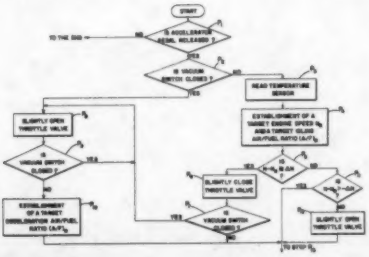
Koyo Nakamura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 4, 1981, Ser. No. 231,343

Claims priority, application Japan, Feb. 6, 1980, 55-12797[U]

Int. Cl.³ F02D *33/00*

U.S. Cl. 123—339 **5 Claims**



1. A system for controlling no load operation of an internal combustion engine, comprising:

means for detecting the idling of the engine and producing an idle signal;

an engine speed sensor for generating an actual engine speed signal indicative of the actual engine speed;

an air fuel ratio sensor for generating an actual air fuel ratio signal indicative of the actual air fuel ratio;

an engine temperature sensor for generating a temperature signal indicative of the actual engine temperature;

target idle speed generating means for receiving said temperature signal and generating a target idle speed signal having a temperature dependent value indicative of idle speed required to sustain the operation of the engine at the sensed engine temperature;

means for comparing said actual engine speed signal with said target idle speed signal and generating an idle air flow control signal indicative of the change in the air flow to the engine necessary to reduce the difference between the actual engine speed and the target idle speed to a predetermined engine speed differential value;

a throttle valve for throttling said engine;

means, operatively connected to said throttle valve, for varying the closure position thereof and for controlling the idle air flow to the engine in response to said idle air flow control signal to change the actual engine speed and reduce the difference between the actual engine speed and the target idle speed to said predetermined engine speed differential value;

target idle air fuel ratio generating means, responsive to said idle signal, for receiving said temperature signal and generating a target idle air fuel ratio signal having a temperature dependent value;

means for comparing said actual air fuel ratio signal with said target idle air fuel ratio signal and generating an idle air fuel ratio control signal indicative of the change in the air fuel ratio of the air fuel mixture to the engine necessary to reduce the difference between the actual air fuel ratio and the target idle air fuel ratio to a predetermined air fuel ratio differential value; and

means for controlling the air fuel ratio of the air fuel mixture to the engine in response to said idle air fuel ratio control signal to change the air fuel ratio of the idle air fuel mixture to the engine and reduce the difference between the actual air fuel ratio and the target idle air fuel ratio to said predetermined air fuel ratio differential value.

4,398,515

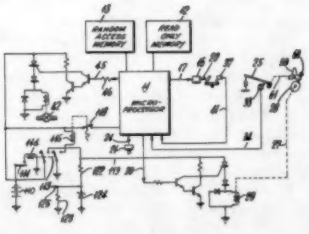
INTERNAL COMBUSTION ENGINE FUEL CONTROL SYSTEM

Robert E. Canup, Poughkeepsie; Edward Mitchell, Hopewell Junction, both of N.Y., and Martin Alperstein, deceased, late of Fishkill, N.Y. by Ellen J. Alperstein, executrix, assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,855

Int. Cl.³ F02M *59/42, 63/02;* **F02B** *3/00*

U.S. Cl. 123—357 **3 Claims**



1. Fuel control system for an internal combustion engine employing a diesel type fuel injection pump including a pair of pumping plungers actuated simultaneously with radial movement toward one another and having a metering valve, comprising

a microprocessor having a read only memory and means for entering a first series of data representing a curve of engine throttle positions for predetermined speeds covering an operating range and a second series of data representing a curve of throttle positions for speeds covering an idling range, incrementally positionable stop means for limiting the opening of said metering valve from zero to maximum,

means for connecting said stop means to an output of said microprocessor,

speed signal means comprising a pulse generator actuated by said engine,

means for connecting said pulse generator to an input of said microprocessor,

a random access memory with said microprocessor for temporarily storing data relating to operating parameters of said system,

throttle means,

means for setting a fast idle state of said throttle means,

means for connecting said fast idle state means to an output of said microprocessor,

first switch means for determining activation of said throttle,

means for connecting said first switch means to an input of said microprocessor,

second switch means for sensing zero position of said metering valve, and

means for connecting said second switch means to an input of said microprocessor.

4,398,516

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

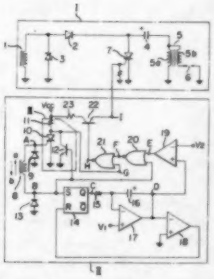
Tsutomu Momoyama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 239,206

Claims priority, application Japan, Mar. 3, 1980, 55-27060; Mar. 3, 1980, 55-27061; Apr. 9, 1980, 55-47723; Apr. 9, 1980, 55-47724

Int. Cl.³ F02P *5/08, 5/04*

U.S. Cl. 123—418 **8 Claims**



1. An ignition timing control system for an internal combustion engine comprising:

angular signal generating means for generating first and second angular signals in synchronism with the revolutions of the engine at respective first and second crank positions which said seciond crank position is retarded from said first crank position;

integrator means whose input is connected to said generating means for receiving said second angular signal and for initiating the discharge mode of said integrator with a constant current and wherein when the output of said integrator in said discharging mode reaches a first predetermined value said integrator operates in a charging mode with a constant current in order to generate alternate charge and discharge outputs to form a triangular wave form output;

first circuit means for generating an output when said charge output reaches a second predetermined value;

second circuit means connected to the output of said generating means for receiving said first and second angular signals

wherein said second circuit means generates an output between said first and second crank positions;

logic means whose input is connected to the output of said first and second circuit means respectively and whose output provides an ignition timing signal.

4,398,517

AIR-FUEL RATIO CONTROL SYSTEM

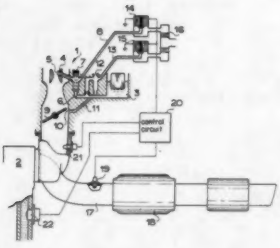
Masaharu Kubota, Musashino, and Toshiro Kurihara, Koganei, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Jul. 7, 1981, Ser. No. 280,969

Claims priority, application Japan, Jul. 16, 1980, 55-97361

Int. Cl.[3] F02M *17/00*

U.S. Cl. 123—440 3 Claims



1. In an air-fuel ratio control system for an internal combustion engine having a carburetor including an intake passage, an electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied to said carburetor, an O_2 sensor for detecting oxygen concentration of exhaust gases from the engine, a temperature sensor for detecting the engine temperature, an acceleration detecting sensor for being operated corresponding to negative pressure in said intake passage of the engine, and a closed loop control circuit responsive to outputs of all of the sensors for producing a control output signal for driving said electromagnetic valve for correcting the air-fuel ratio, the improvement comprising

a switching circuit means provided in said control circuit for rendering said control circuit non-responsive to the output of said O_2 sensor,

gate means responsive to outputs of said temperature sensor and said acceleration detecting sensor for actuating said switching circuit comprising an AND gate connected to said temperature sensor and said acceleration detecting sensor, and

said gate means being so arranged to actuate said switching circuit means in such a manner that air-fuel ratio correction control with the closed loop control circuit is carried out when engine temperature is higher than a predetermined temperature and stopped when engine temperature is lower than said predetermined temperature and said acceleration detecting sensor is operated.

4,398,518

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

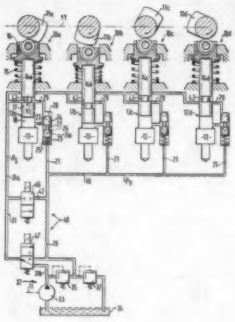
Jean Leblanc, Lyons; Jean Pigeroulet, Villeurbanne, both of France, and Max Straubel, Stuttgart, Fed. Rep. of Germany, assignors to Robert-Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 223,889

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3000977

Int. Cl.[3] F02M *39/00*

U.S. Cl. 123—446 10 Claims



1. A fuel injection apparatus for internal combustion engines, in particular for Diesel engines, having per engine cylinder one mechanically driven pump piston of an injection pump and a pump work chamber in said injection pump supplied with fuel under supply pressure by a supply pump and preferably combined with an injection nozzle into a pump/nozzle unit, each apparatus having one control slide, said slide being limited by a pressure chamber and actuatable by the control pressure of a source of control fuel counter to the force of at least one restoring spring, said control slide further being inserted into a discharge channel in permanent communication with said pump work chamber and arranged to close this discharge channel in response to said control pressure in order to initiate a variable onset of injection and further arranged to open it again in order to terminate the injection, said apparatus further including a control apparatus for all the injection pumps, whereby said control pressure can be exerted via control lines upon said pressure chambers of said control slides, characterized by the following characteristics:

(a) said control apparatus comprises a magnetic valve assembly common to all of said injection pumps and arranged to determine the onset and duration of said control pressure upon the pressure chambers of said control slides and a separate distributor apparatus, said distributor apparatus arranged to connect, said control lines of said pressure chambers in sequence with a control pressure line;

(b) said control pressure line common to all of said injection pumps can be made to communicate with a low-pressure line by means of said magnetic valve assembly;

(c) said control pressure (P_S) required for actuation of said control slides and exerted via said distributor apparatus upon one of said pressure chambers at a time is built up by means of the magnetic valve assembly which blocks said discharge of said fuel out of the control pressure line into the low-pressure line and is subsequently relieved toward said low-pressure line for the return stroke of the control slide; and further wherein

(d) said magnetic valve assembly comprises two parallel actuated, switchable, magnetic valves the first of said magnetic valves being open toward said low-pressure line before the onset of injection said first valve arranged to block the discharge of said control fuel out of said control

pressure line into said low-pressure line when said second magnetic valve is already blocking fuel discharge before the onset of injection, in order to initiate the injection, and further wherein said second magnetic valve controls the termination of injection by means of its switching movement enabling said discharge, while said first magnetic valve is still in a switch-over position.

4,398,519

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

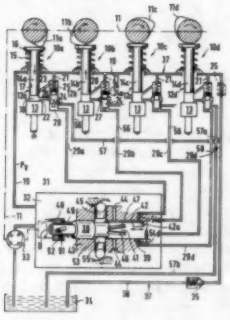
Raymond Tissot, Genas; Jean Leblanc, Lyons, and Jean Pigeroulet, Villeurbanne, all of France, assignors to Robert-Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,747

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3024963

Int. Cl.[3] **F02M** *39/00*

U.S. Cl. 123—446 **8 Claims**



1. A fuel injection apparatus for diesel-type internal combustion engines, having one mechanically driven pump piston of an injection pump per engine cylinder combined with an injection nozzle into a pump/nozzle, each said apparatus having one control slide hydraulically actuatable counter to a force of at least one restoring spring in a restoring spring chamber, said control slide defining a pressure chamber and being inserted into an overflow channel in permanent communication with a pump work chamber, each said apparatus having a control line through which control pressure from at least one pump work chamber of a control pressure pump which is common to all said injection pumps can be fed to or relieved from said pressure chamber of the respective control slide, said control slide arranged to close said overflow channel in order to initiate the onset of injection with the control pressure fed to the pressure chamber and further arranged to open again in order to terminate injection with relieved control pressure in the pressure chamber, and further including a supply pump which supplies said control pressure pump as well as the injection pump via a supply line with fuel from a tank, said supply pump which supplies said control pressure pump with fuel under a supply pressure (p_V) is arranged to be connected to said pump work chambers of said injection pumps via filling lines separate from each said control line, and further each said filling line is connected to said spring restoring chamber and to said pump work chamber via an inlet conduit which is disposed in the wall of the pump work chamber and further said inlet conduits are controlled by said pump pistons, characterized in that said filling lines are connected with said supply pump via said supply line which is common to all said injection pumps, and said common supply line being under said supply pressure (p_V) and arranged to bypass the said pump work chamber of said control pressure pump, and further wherein each said control line is separated over its whole length from the said supply line as well as from said filling lines and said inlet conduits.

4,398,520

IGNITION AND FUEL INJECTION SYSTEM FOR MULTICYLINDER ENGINES

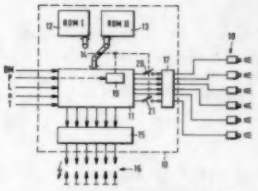
Alfred Schulz, Oberriexingen, and Martin Zechnall, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,436

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013052

Int. Cl.[3] **F02D** *17/02;* **F02B** *3/00;* **F02D** *9/00, 5/00*

U.S. Cl. 123—481 **5 Claims**



1. Multi-cylinder internal combustion engine and ignition and fuel injection control system combination having

memory means (**12**, **13**; **112**) for storing engine operating characteristics;

computing means (**11**) connected to the memory means for receiving engine operating parameter signals (BM, p,L,n,T), and providing engine operating output signals, in accordance with, and as a function of stored engine operating characteristics;

and output interfaces (**15**, **17**) controlling ignition and fuel injection events, respectively, in respective cylinders of the engine, connected to and receiving the engine operation output signals from said computing means;

said combination having means (**20**, **21**, **23**, **24**) for selectively reducing the number of working or operating cylinders in accordance with loading on the engine, by interrupting the supply of fuel to some of the cylinders of the engine,

wherein, in accordance with the invention,

the memory means comprises

a plurality of storage fields or addresses (**12**, **13**; **112**, **150**, **151**), each storing a substantially complete set of data representing engine operating characteristics with respectively different numbers of operating or working cylinders; for

means (**19**, **119**)/recognizing conditions of engine operation with less than all of the cylinders;

and switching means (**14**, **114**) connected to and controlled by the engine operation condition recognition means (**19**, **119**) connecting that one of the storage fields or addresses of the memory means to the computing means for storing the set of the data representing engine operating characteristics with the then operating number of the cylinders of the engine.

4,398,521

DUAL FLOW PROPANE UNIT

Eiko A. Schuurman, Nieuwegein, Netherlands, assignor to John M. McNamara, Port Jefferson Station, N.Y., a part interest

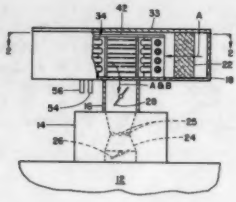
Filed Aug. 19, 1981, Ser. No. 294,221

Int. Cl.[3] **F02M** *15/00*

U.S. Cl. 123—527 **8 Claims**

1. A supply unit for discharging a gaseous fuel into a flow of air comprising a plurality of stacked tubular elements, means for supporting said tubular elements to be spaced from each other, means for limiting flow of air to between and around

said elements, manifold means communicating in parallel with the interiors of said tubular elements for maintaining a uniform fuel pressure within said elements, means for supplying gaseous fuel under pressure to said manifold means, and rows of spaced openings in said tubular elements for discharging said fuel directly into said air in a direction parallel to the axial length of said stacked tubular elements.



4,398,522

INTAKE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

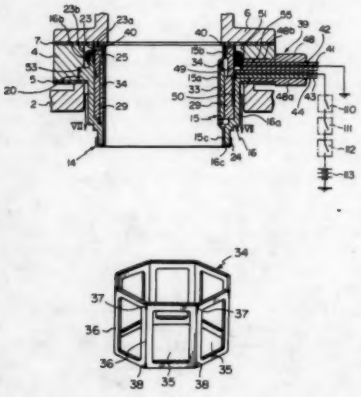
Yosio Kuroiwa; Keigo Kato, both of Toyota, and Masahisa Ando, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 1, 1981, Ser. No. 326,202

Claims priority, application Japan, Dec. 4, 1980, 55-173194[U]

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **11 Claims**



1. A hollow heater vessel of an internal combustion engine, which is placed in an intake passage between fuel supply means and a cylinder of the engine, said hollow heater vessel comprising:

an inner pipe having therein a mixture passage which is aligned with the intake passage;

an outer pipe radially spaced from and surrounding said inner pipe;

a plurality of PTC elements each being inserted between said inner pipe and said outer pipe and having an outer wall and having an inner wall which is in contact with the outer wall of said inner pipe, and;

insulating means inserted between said inner pipe and said outer pipe and having at least one hole which receives therein one of said PTC elements and has a contour shape substantially equal to that of said PTC elements.

4,398,523

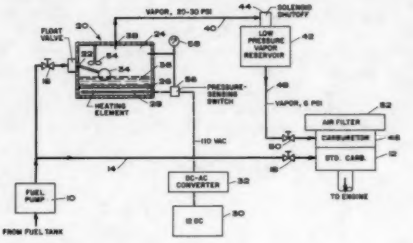
FUEL CONSERVATION DEVICE

Dennis R. Henson, Rte. 3, Eufala, Okla. 74432

Filed Nov. 18, 1980, Ser. No. 208,070

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **1 Claim**



1. A fuel conservation apparatus for an internal combustion engine having an electrical system and a fuel pump and a carburetor, said fuel conservation apparatus comprising housing means interposed between the fuel pump and carburetor and having two independent compartments, one of said compartments being a vaporization compartment and the other of said compartments being a heating compartment, said housing having inlet port means providing communication between the vaporization compartment and the fuel pump for selectively directing said raw fuel into the vaporization compartment and outlet port means in communication with the vaporization compartment for discharging vaporized fuel therefrom, electrical heating means provided in said heating compartment and operably connected with the electrical system of the internal combustion engine for hearing the fuel in the vaporization compartment to provide vaporization of the fuel, auxiliary carburetor means interposed between the outlet port means and the carburetor whereby vaporized fuel only may be delivered to power the internal combustion engine, and bypass means connected between the fuel pump and the first mentioned carburetor for selectively bypassing the housing means and auxiliary carburetor means, a first lock off valve means interposed between the inlet port and the fuel pump for providing selective flow of fuel to the housing, and second lock off valve means interposed between the housing and the carburetor for cooperation with the first lock off valve means to remove the fuel conservation apparatus from the internal combustion engine system if desired.

4,398,524

EXHAUST GAS RECIRCULATION SYSTEM

Shane H. Rachedi, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 24, 1981, Ser. No. 286,302

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **4 Claims**

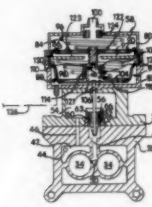
1. An exhaust gas recirculation (EGR) system for use with an internal combustion engine having intake and exhaust manifolds, a carburetor induction passage having a venturi and a pressure sensing port adjacent the venturi for sensing the vacuum level therein, the system comprising;

an EGR duct connecting the gases from the exhaust manifold to the engine intake manifold, and a one-piece integral assembly of a spring closed sonic flow EGR valve means in the duct normally closing the duct to prevent recirculation of gases and movable to open positions in response to a signal pressure acting thereon and a fluid pressure actu-

ated servo means connected to the valve means for moving the valve means in response to the signal pressure,

the servo means comprising a housing having a pair of annular flexible diaphragm means spaced from one another and together partitioning the housing into a plurality of fluid chambers, means connecting a first one of the chambers at all times to the venturi port, means connecting a second diaphragm means to the EGR valve means, and means subjecting the second diaphragm means to the actuating signal pressure for actuating the EGR valve means, a second one of the chambers having an air bleed valve assembly operably associated therewith to bleed the actuating pressure at times, the assembly including an air vent and a spring closed air bleed valve movably associated with the vent to control flow through the same, a part of the assembly being movable with the first diaphragm means to control the bleed of air to control the movement of the EGR valve means as a function of the change in venturi vacuum;

the EGR valve means consisting of an essentially conical pintle mounted for a reciprocating movement into and out of a stationary cooperatively shaped nozzle valve seat to



define convergent-divergent flow paths at all open positions of the pintle for the flow of exhaust gases therethrough, the valve means being so designed and constructed to provide sonic flow through the valve means over essentially the entire vacuum operating level of the engine to thereby establish a constant rate of flow of exhaust gases through the valve means at each open position of the valve means, the rates of flow through the valve means thereby varying solely as a function of the area opening of the valve means as determined by the position of the pintle in response to the change in venturi vacuum level controlling the signal pressure acting on the servo means and being independent of the pressure level variations adjacent the valve means;

the bleed valve including a subhousing secured to the second diaphragm means and having a hole therein defining the air vent, a valve movably mounted in the subhousing, spring means biasing the latter valve into the hole to block the same, the second diaphragm means also having a vent therethrough into the chamber defined by the subhousing connecting the signal pressure at all times to the subhousing chamber.

4,398,525

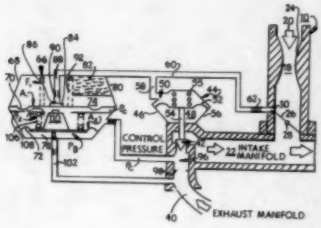
MULTI-STAGE EXHAUST GAS RECIRCULATION SYSTEM

Daniel C. Ahrns, Livonia, and Shane H. Rachedi, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1981, Ser. No. 320,249
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **7 Claims**

1. A two-stage exhaust gas recirculation (EGR) system for use with an engine having intake and exhaust manifolds, including, an EGR passage connecting the manifolds for recirculating a portion of the exhaust gases into the engine, an air/fuel induction passage having a throttle valve variable movable across the induction passage to control flow therethrough, the induction passage having a pressure sensing port upstream of the edge of the throttle valve in its closed position to expose the port to essentially atmospheric pressure when the throttle valve is closed and progressively to the level of the manifold vacuum as the valve is opened, a spring closed EGR valve movably mounted in the EGR passage, an engine vacuum controlled first servo connected to the pressure sensing port and to the EGR valve to open the same in response to opening movements of the throttle valve, and an air bleed pressure regulating device in the connection between the first servo and port to regulate the level of vacuum applied to the servo,

the air bleed device including an air vent and a spring opened bleed valve movably associated with the vent to control communication of air to the same, and second multi-stage servo means operably connected to the bleed



valve to regulate movement of the same, the second servo means including first pressure responsive means connected to the bleed valve and responsive to the level of pressure in a constant pressure control chamber defined between the EGR valve and a flow restricting orifice located upstream of the EGR valve to constitute a first pressure regulating stage of movement of the bleed valve and EGR valve below predetermined exhaust manifold pressure levels, and second means movable in response to the pressure of the gases in the exhaust manifold acting thereon above the predetermined exhaust backpressure level to vary the movement of the bleed valve in a second regulatory stage of movement to provide a second regulatory movement of the EGR valve at a rate different than that of the first stage.

4,398,526

PLASMA IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kyugo Hamai, Yokosuka; Yasuhiko Nakagawa, Kamakura; Meroji Nakai, Yokosuka, and Ryuzaburou Inoue, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 31, 1981, Ser. No. 288,748
Claims priority, application Japan, Jul. 31, 1980, 55-105704
Int. Cl.³ F02P *3/08*
U.S. Cl. 123—606 **14 Claims**

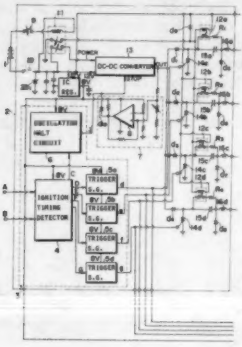
1. A plasma ignition system for a multicylinder internal combustion engine having a high compression ratio, each cylinder being provided with a plasma ignition plug, which comprises:

(a) a plasma ignition energy generating circuit which generates plasma ignition energy, said circuit having (1) at least one capacitor which charges to a predetermined high DC voltage and operatively discharges the predetermined high DC voltage into said plasma ignition plugs according to a predetermined ignition order and (2) at least one inductor means, connected between said capacitor and each of the plasma ignition plugs, which operatively receives the predetermined high DC voltage discharged by said capacitor;

(b) an oscillation device having at least one oscillator means

which operatively generates a high-frequency oscillation voltage; and

(c) means connected to said plasma ignition energy generating circuit and oscillation device for controlling the discharge of said capacitor so as to apply the DC voltage within said capacitor to one of the plasma ignition plugs at a predetermined ignition timing of the corresponding engine cylinder according to a predetermined ignition



order and, at the same time, for actuating said oscillation device to apply the high-frequency oscillation voltage to one of the remaining plasma ignition plugs installed within the engine cylinder which is substantially in the start of compression stroke until at least the plasma ignition is started at the remaining plasma ignition plug by subsequent application of said DC voltage whereby a complete combustion of air-fuel mixture supplied into the engine cylinders can be achieved for a high-compression engine.

4,398,527

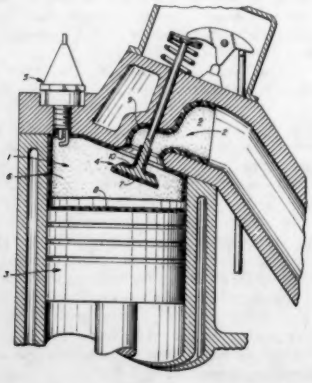
INTERNAL COMBUSTION ENGINE HAVING MANIFOLD AND COMBUSTION SURFACES COATED WITH A FOAM

Jay D. Rynbrandt, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 180,190, Aug. 22, 1980, abandoned, and a continuation-in-part of Ser. No. 205,535, Nov. 10, 1980, abandoned. This application Jul. 1, 1981, Ser. No. 278,012

Int. Cl.³ F02B *75/08*

U.S. Cl. 123—668 **11 Claims**



1. In an internal combustion engine comprising a combustion chamber having a surface exposed to combustion, the improvement which comprises at least a portion of said surface, having a combination of a thermal conductance and a thermal penetration which permits the temperature of said surface during the combustion process to be in excess of the temperature at which deposits form, said surface storing insufficient heat to substantially raise the temperature of the incoming air-fuel charge during the engine intake stroke and compression stroke, wherein said surface portion has a thermal penetration expressed as $\sqrt{K\rho C}$ of less than about 600 $J/m^{2*}Ksec^{1/2}$, and a thermal conductance expressed as K/d of at least about 2000 $J/m^{2*}Ksec$, and the product of the thermal penetration times thermal conductance is less than about 3×10^{6} $J^2/m^{4*}K^2sec^{3/2}$, and said surface portion is a thermally stable, resinous syntactic foam comprising about 40 to 70% volume of inorganic, hollow microspheres, in a matrix comprising a composite of at least five of the group consisting of:

(a) polyimide resin;

(b) carbon;

(c) silica; and

(d) at least any two of the group consisting of boron, aluminum, and the oxides, nitrides, and carbides of silicon, titanium, chromium, tantalum, niobium, and zinc.

4,398,528

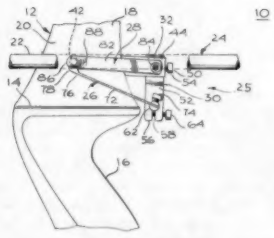
ARCHERY BOW ASSEMBLY

Fernando Troncoso, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754

Filed Jan. 11, 1982, Ser. No. 338,334

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—24 R **5 Claims**



1. An improved archery bow assembly, said assembly comprising in combination:

A. an archery bow having an arrow shelf and sidewall defining an arrow window;

B. an archery arrow; and,

C. an improved arrow rest disposed in and behind said window and supporting said arrow in said window for shooting from said bow, said rest including

i. a bracket having

a. a generally horizontal arm releasably secured to said sidewall on the side thereof opposite said window and extending rearwardly of said window,

b. a connector interconnected to and depending below said horizontal arm adjacent the rear end thereof,

c. a generally horizontal cross arm adjustably clamped in said connector and extending transversely of said bow from said opposite side to a position directly behind said window,

ii. a first flexible resilient depressible arrow support releasably connected to said cross arm behind said window, extending into said window adjacent said sidewall and supporting the bottom of said arrow shaft;

iii. a second, flexible resilient arrow support extending into said window and supporting and spacing said shaft from said sidewall and, the rear end of said first arrow support being disposed below the front end of said second

arrow support and being releasably and laterally adjustably secured in a horizontal slot in said cross arm, said cross arm being rotatable in said connector to adjust the height of the front end of said first arrow support; and,

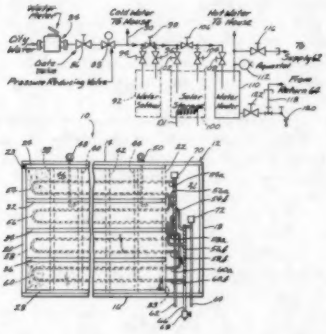
iv. a generally horizontal cross bar interconnecting said connector and said rearwardly extending horizontal arm above said cross arm, and extending transversely of said bow from said connector to a position directly behind said window.

4,398,529

SOLAR HEATING WALL

James L. Schoenfelder, 128½ E. Washington St., Iowa City, Iowa 52240

Filed Oct. 21, 1981, Ser. No. 313,294
Int. Cl.³ F24J 3/02
U.S. Cl. 126—436 6 Claims



1. A water heatable wall for a structure comprising:

a first rectangular frame having a first upper horizontal frame member, a first lower horizontal frame member, and a plurality of parallel vertical studs extending between said first upper and first lower frame members;

a second rectangular frame having at least one vertical side frame member and a plurality of horizontal spaced apart parallel frame members extending across the width of said second rectangular frame;

said first and second rectangular frames having the same size and being attached to one another in superimposed relationship to form a wall frame having a thickness which comprises the combined thickness of said first and second frames;

at least one elongated flexible water tube positioned in at least one of the spaces between said spaced apart horizontal frame members of said second frame, said tube having an inlet end and an outlet end extending beyond the outer rectangular edges of said second rectangular frame;

concrete filling the open areas within said wall frame so as to form a concrete wall having a thickness and shape of said wall frame; and

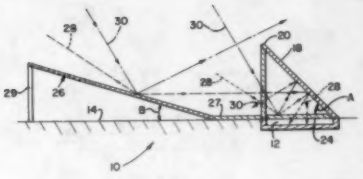
said water tubes, said vertical studs of said first frame, and said horizontal members of said second frame being embedded within said concrete.

4,398,530

SOLAR COLLECTOR AND HEATING AND COOLING SYSTEM

Norman B. Saunders, 15 Ellis Rd., Weston, Mass. 02193

Continuation of Ser. No. 766,025, Feb. 7, 1977, abandoned, which is a division of Ser. No. 594,315, Jul. 9, 1975, Pat. No. 4,078,603. This application Dec. 22, 1980, Ser. No. 218,557
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 8 Claims



1. A monitoring system for concentrating varying amounts of heat onto a heat absorptive fluid and varying amounts of heat and diffused light into a predetermined area of the interior of an enclosed structure, said system comprising, in combination:

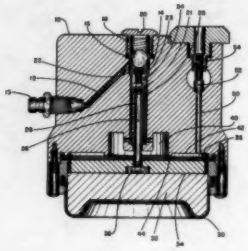
at least one substantially closed unit adapted to be mounted on the top of said enclosed structure, said unit comprising a first substantially transparent planar window transparent to said heat and light and having a front, rear and side edges, said first window being adapted to be positioned in a substantially horizontal plane above said predetermined area; a second substantially planar window transparent to said heat and light and having bottom, top and side edges, said bottom edge of said second window being adjacent said front edge of said first window, said second window extending in a plane substantially normal to the plane of said first window so that said second window extends above said first window when said first window is positioned substantially horizontally above said predetermined area; a first relector having a top, bottom and side edges, said top edge of said first reflector being adjacent said top edge of said second window, and said bottom edge of said first reflector being adjacent said rear edge of said first window so as to reflect to said first window solar radiation transmitted through said second window toward said first reflector; and side reflectors disposed on the sides of said unit adjacent the side edges of said first and second windows and said first reflector; and a second reflector positioned on the side of said second window opposite said first reflector for reflecting solar radiation along a path which varies according to the altitude and azimuth of the sun when the mean plane of said second window is disposed substantially vertically and faces equatorially so that solar radiation reflected by said second reflector is directed through said second window at average winter altitudes of the sun and is directed away from said second window at average summer altitudes of the sun; and

fluid transport means including a trough positioned adjacent said first window in said predetermined area for transporting a heat absorptive fluid between said first window and said trough so that said fluid can absorb heat directed through said first window into said predetermined area, said trough including a surface for transmitting from said first window diffused light and heat through said trough into the interior of the enclosed structure.

4,398,531
PERCUSSOR

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation-in-part of Ser. No. 50,685, Jun. 21, 1979, abandoned, and a continuation-in-part of Ser. No. 207,468, Nov. 17, 1980. This application Jan. 8, 1981, Ser. No. 223,354
Int. Cl.³ A61H 7/00
U.S. Cl. 128—55 4 Claims

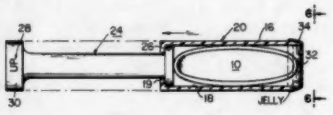


1. A percussor comprising:
a reciprocating assembly comprising a reciprocating plate and an applicator cooperating therewith for directing reciprocating motion from said plate to a user,
a gas outlet passageway, a gas pressure chamber and releasable gas sealing means for forming a gas-tight seal therebetween,
a gas inlet passageway communicating with said gas pressure chamber for introducing gas thereto at a pressure sufficient to release said gas-tight seal causing movement of said reciprocating assembly,
valve means for temporarily interrupting the flow of gas from said gas inlet passageway to said gas pressure chamber when said reciprocating assembly is moved, and
a valve actuation means rigidly secured to said reciprocating assembly and simultaneously reciprocating therewith for alternately opening and closing said valve means.

4,398,532
INSERTION DEVICE FOR A DIAPHRAGM

William J. Sweeney, III, 912 Fifth Ave., New York, N.Y. 10021

Filed Dec. 12, 1980, Ser. No. 215,626
Int. Cl.³ A61F 5/46
U.S. Cl. 128—127 27 Claims

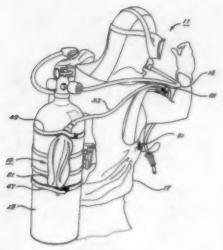


1. A diaphragm dispensing apparatus comprising:
an elongated hollow member having a chamber for longitudinally holding a diaphragm and an opening on one end of said member through which said diaphragm is dispensed;
a diaphragm resiliently compressed and held within said chamber of said elongated hollow member;
a spermacidal agent in said chamber in contact with said diaphragm;
a plunger means slidable within said hollow member at the other end of said member for dispensing said diaphragm through said opening;
an indicia means on said plunger means for indicating the proper orientation of said diaphragm for insertion; and
sealing means to seal said diaphragm within said chamber until dispensed by sliding of the plunger means within said hollow member.

4,398,533
DRINKING DEVICE FOR DIVERS

Randall R. Barker, 6200 Carswell Access Rd. - Lot No. 3, Fort Worth, Tex. 76114

Filed May 4, 1981, Ser. No. 260,002
Int. Cl.³ A61M 15/00
U.S. Cl. 128—202.15 5 Claims

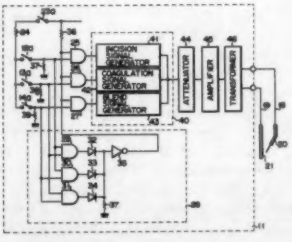


1. A method of providing liquid for drinking while engaged in underwater diving, comprising:
providing a container with a chamber for holding liquid, a passage leading to the chamber with a mouthpiece at an entrance to the passage, and valve means located near the entrance for opening and closing the passage to the chamber;
providing the container with pressure compensator means for equalizing pressure in the chamber with exterior hydrostatic pressure;
placing a liquid into the chamber; then
providing a lower pressure at the mouthpiece than in the chamber to draw liquid into the passage and past the valve means; then
closing the valve means while maintaining the lower pressure and submerging with the container.

4,398,534
ELECTRICAL SURGICAL KNIFE DEVICE

Toshihiko Hagiwara, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,282
Claims priority, application Japan, Dec. 4, 1979, 54-157282
Int. Cl.³ A61B 17/39
U.S. Cl. 128—303.14 5 Claims



1. An electric surgical knife device comprising:
current generating means for generating an incision current, coagulation current and blend current;
current selection means for selecting one of the currents generated by said current generating means;

detector means coupled to said current selection means for generating an output signal when said current selection means selects any two of the currents generated by said current generating means; and

stop means coupled to said detector means for stopping the current generation by said current generating means in response to the output signal from said detector means.

4,398,535

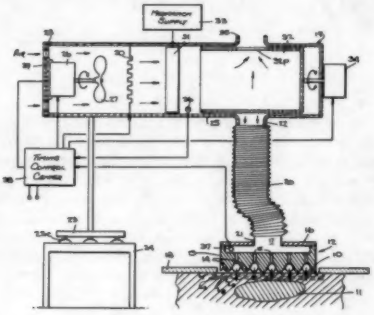
HYPERTHERMIA TECHNIQUE

Raul Guibert, Los Angeles, Calif., assignor to Sunset Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 97,787, Nov. 27, 1979, Pat. No. 4,307,286. This application Jun. 16, 1981, Ser. No. 274,504

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—399 **12 Claims**



1. A thermal therapy device for a living organism having a normal body temperature, the device serving to raise the temperature of a region underlying the body skin to a hyperthermia level having beneficial effects, said device comprising:

A. a source including a heater and means operating in conjunction with the heater for generating a pulsatory air wave constituted by periodic pulses having a predetermined duration flowing at high velocity and having a high temperature well above said normal body temperature, and means providing relatively static intervals between said periodic pulses thereby creating a medium temperature somewhat above said normal temperature at the site of application; and

B. an applicator coupled to said source to apply said pulsatory wave to a limited skin area of the body to thermally penetrate the tissue to cause the region thereunder to rise in temperature to said hyperthermia level without injury to surface tissue, rapid heat transfer taking place from the air to the surface layer of the skin area during said pulses, the intervals in said wave having a duration relative to that of said pulses whereby heat transfer inwardly from the surface layer of the tissue takes place during said intervals to cause a reduction in the temperature of the surface layer sufficient to prevent excessive heating thereof.

4,398,536

SCANNING BURST TACHYCARDIA CONTROL PACER

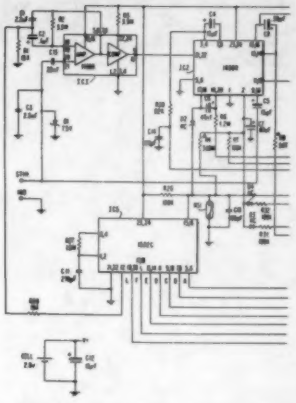
Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Jul. 17, 1981, Ser. No. 284,349

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **54 Claims**

1. A tachycardia control pacer comprising means for confirming tachycardia, means responsive to each operation of said confirming means for generating a burst of heart stimulating pulses at a constant rate, and means for controlling succes-



sive heart stimulating pulse bursts to be generated at different constant rates.

4,398,537

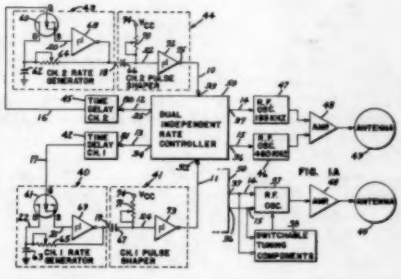
INDEPENDENTLY RATE-ADJUSTING MULTIPLE CHANNEL CONTROLLER FOR NERVE STIMULATOR TRANSMITTER

Dwight N. Holmbo, Prior Lake, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 19, 1981, Ser. No. 226,393

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—420 R **17 Claims**



1. An independently rate-adjustable multiple channel controller-transmitter for a nerve stimulator to be used in conjunction with an implanted stimulation pulse output unit comprising:

rate generating means for producing a plurality of trigger signals of independently adjustable rate;

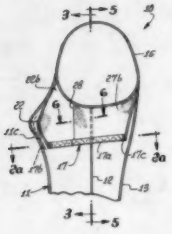
transmitting means for generating pulsed bursts of RF energy at separate frequencies for each of said channels, in response to the corresponding trigger signals of said rate generating means, to be received by said implanted unit; and

means operatively connected for normally passing said trigger signals from said rate generating means to said transmitting means and operative upon coincidence of said trigger signals for preventing the overlap of said trigger signals in said transmitting means.

4,398,538
WOMENS SOFT FABRIC GARMENT WITH INTEGRAL BRASSIERE

Christina E. Johnson, Los Angeles, Calif., assignor to Olga Company, Van Nuys, Calif.

Filed Feb. 8, 1982, Ser. No. 346,484
Int. Cl.³ A41C *1/06, 3/00;* A41D *5/00*
U.S. Cl. 128—432 **12 Claims**



1. In a women's garment, the combination comprising

(a) a bodice having a soft fabric front portion which is elastically stretchable to conform to the bust of the wearer,

(b) an elastic band spaced inwardly from the bodice and located in a loop shaft path everywhere free of attachment to the bodice and adapted to extend substantially completely about the body of the wearer so as to tension the band,

(c) and a fabric panel attached to the bodice above the level of the band to downwardly hang free of the bodice and freely suspending the band to extend crosswise of said bodice soft fabric front portion so that when tensioned the band will anchor a front panel portion of the fabric panel beneath and in supporting relation to the bust of the wearer,

(d) said band suspending panel including a front portion having left and right sections each consisting of soft, two-way stretchable fabric with breast cup configuration adapted to independently conform to the bust of the wearer, inwardly of said bodice soft elastically stretchable fabric front portion of the bodice, said sections being free of attachment to said front portion of the bodice.

(e) and a tape-like insert extending upwardly from the band medially of said front panel portion and connected therewith, said insert being non-stretchable, and an elastically stretchable tape extending crosswise above said insert and from which said panel front portion left and right sections and said bodice front portion are suspended.

4,398,539
EXTENDED FOCUS TRANSDUCER SYSTEM

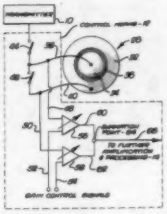
Andrew Proudian, Chatsworth, Calif., assignor to Second Foundation, Rancho Cordova, Calif.

Filed Jun. 30, 1980, Ser. No. 164,830
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **14 Claims**

1. A transducer system for use in ultrasonic scanning devices comprising:

(i) A piezoelectric transducer of a dish configuration having a spherical surface and a radius of curvature R and adapted to emit ultrasonic waves having a wavelength λ in response to a signal from a transmitter, detect echoes of said ultrasonic waves, and provide information to a processing means which is indicative of said detected echoes, said transducer including a central circular section of diameter d_1, where d_1 is approximately equal to $2\sqrt{\lambda R/3}$ and an annular peripheral section surrounding said central section, said peripheral and central sections having a combined diameter of d_2, where d_2 is approximately equal to $2\sqrt{\lambda R}$, said peripheral section being electrically isolated from said central section; and

(ii) control means for selectively electrically coupling said central section alone and in combination with said peripheral section to said transmitter to form two operational configurations of the transducer during a transmission mode, whereby said transducer emits ultrasonic waves which, for each of said configurations, converge at a different focal point approximately within the range R/4

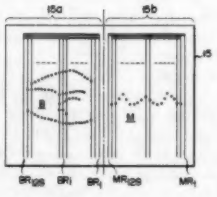


to R beyond said transducer, said control means also for selectively electrically coupling said central section alone and in combination with said peripheral section to said processing means to form two operational configurations of the transducer during a reception mode, whereby for each of said configurations ultrasonic echoes which emanate from different distances of interest beyond said transducer, within overlapping zones of focus for each focal point, are substantially in focus at said transducer.

4,398,540
COMPOUND MODE ULTRASOUND DIAGNOSIS APPARATUS

Yasuhiko Takemura, Nishinasuno, and Takahisa Okazaki, Otawara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 4, 1980, Ser. No. 204,003
Claims priority, application Japan, Nov. 5, 1979, 54-143095; Nov. 9, 1979, 54-145150
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **10 Claims**



9. A compound mode ultrasound diagnosis apparatus comprising:

transducer means for radiating ultrasound beams toward an object under examination and for receiving ultrasound echoes reflected therefrom;

means for processing the ultrasound echoes to obtain ultrasound echo signals corresponding to distinct scan modes;

digital scan converter means for converting the echo signals into video signals, said digital scan converter means including

(a) analog-to-digital converter means for converting said ultrasound echo signals into at least two distinct sets of digital ultrasound echo data, each set of said digital data corresponding to a different one of said distinct scan modes,

(b) memory means having a plurality of distinct memory

areas for storing said at least two sets of digital ultrasound echo data,

(c) write control means for respectively writing said at least two sets of digital ultrasound data into said memory means, each set of said digital data being stored together in a distinct memory area,

(d) read control means for reading out said at least two sets of digital ultrasound data in accordance with a television format,

(e) digital-to-analog converter means for converting the digital ultrasound data read out from said memory means into video signals; and

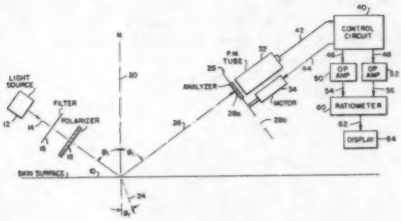
means for displaying the video signals on a television screen, so as to form noninterlaced separate images corresponding to said distinct scan modes.

4,398,541

METHOD AND APPARATUS FOR MEASURING MOISTURE CONTENT OF SKIN

Peter Pugliese, Bernville, Pa., assignor to Xienta, Inc., Bernville, Pa.

Filed May 25, 1978, Ser. No. 909,664
Int. Cl.³ A61B 5/00
U.S. Cl. 128—665 **27 Claims**



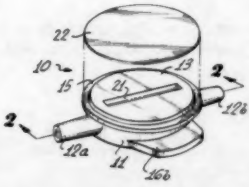
1. An apparatus for performing an in vivo measurement of the moisture content of animal or human skin comprising means for directing light toward a skin surface, means for detecting the degree of polarization of the light reflected from said skin surface, and means for determining the moisture content of the skin in accordance with the detected degree of reflected light polarization.

4,398,542

PRESSURE DIAPHRAGM

Joel N. Cunningham, San Diego; Richard M. Bucchianeri, Escondido, and Stephen H. O'Leary, Encinitas, all of Calif., assignors to Ivac Corporation, San Diego, Calif.

Filed Dec. 15, 1980, Ser. No. 216,650
Int. Cl.³ G01L 7/08
U.S. Cl. 128—675 **23 Claims**



1. A pressure diaphragm comprising:

a substantially rigid body;

fluid inlet means carried by said body for connection to a first IV tube;

fluid outlet means carried by said body for connection to a second IV tube;

a continuously elongated fluid channel formed in said body, one end of said fluid channel communicating with said fluid inlet means and the opposite end of said fluid channel communicating with said fluid outlet means, said fluid channel having a substantially uniform cross-sectional flow area that is substantially equal to or less than the cross-sectional flow area of said first IV tube, and at least a portion of said channel defining an opening through an exterior surface of said body; and

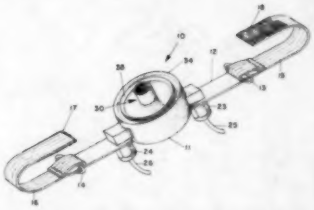
a flexible membrane overlying said opening and sealed to said body around said opening, whereby fluid pressure in said first and second IV tubes is transmitted through said opening to said membrane.

4,398,543

MOISTURE COLLECTING CHAMBER

Felix M. Sandlin, 420 Tower Dr., San Antonio, Tex. 78232; Richard L. De Villez, 10 River Oaks Dr., New Braunfels, Tex. 78130, and Jack D. Waller, 2406 Lipscomb, Amarillo, Tex. 79109

Filed Feb. 11, 1981, Ser. No. 233,565
Int. Cl.³ A61B 19/00
U.S. Cl. 128—760 **1 Claim**



1. An apparatus for use with a device for testing skin moisture by passing a gas having a known moisture content over the skin area to be tested to pick up the moisture in the skin, comprising:

a housing for attaching to the skin surface to be tested;

a cylindrical probe on the housing for sealingly engaging the skin surface to be tested;

a gas inlet and a gas outlet means in fluid communication with the enclosed volume of said cylindrical probe;

a limit means on the housing for engaging the skin surface adjacent the area to be tested;

said limit means including a plurality of concentric rings having a generally triangular cross-section; and

said probe extending a predetermined distance past the limit means to provide a sufficient seal between the probe and skin to be tested when the probe is pressed against the skin area to engage the skin at a deeper level than the engagement made by the concentric rings of the limit means when they engage the skin surface so that the apparatus is uniformly positioned on any user to provide accurate test results.

4,398,544

SINGLE AND MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH VEIN ENTRY INDICATOR

Edward L. Nugent, North Caldwell, and Joseph Kaufman, Emerson, both of N.J., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Oct. 15, 1981, Ser. No. 311,494
Int. Cl.³ A61B 5/14
U.S. Cl. 128—763 **10 Claims**

1. A needle assembly for collecting one or more liquid sam-

ples from a source for subsequent discharge into evacuated containers, comprising

(a) a housing having a forward end and a rearward end;

(b) a sample collection chamber in said housing;

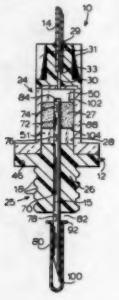
(c) a first access opening in said forward end in liquid flow communication with said chamber;

(d) a first cannula extending outwardly from said first access opening for insertion into said source;

(e) a second access opening in said rearward end in flow communication with said chamber; the improvement characterized by

(f) a second cannula positioned in said second access opening and extending into said chamber to a point spaced from said first access opening;

(g) said second cannula having a first and a second spaced apart opening therein in the part thereof extending into said chamber, said spaced apart openings providing flow communication between said chamber and the lumen of said second cannula; and



(h) a gas permeable, liquid impermeable annular porous plug positioned for reciprocation in said chamber along said second cannula from a first position in which said first opening is covered by said porous plug and said second opening is uncovered, to a second position in which said first opening is uncovered;

(i) whereby when said first cannula engages said source, liquid enters said chamber by forcing any gas therein through said porous plug, and out said second cannula through said first and second openings, and when said second cannula comes into contact with an evacuated container, said porous plug moves toward said second access opening under the influence of a pressure differential on either side thereof, uncovering said first opening and forcing residual air out said second opening on the side of said plug facing said rearward end, to that liquid in said chamber passes through said second cannula to said evacuated container.

4,398,545

PAIN-BLOCKING BANDAGE

J. A. Sam Wilson, Miami, Fla., assignor to Cyclotechnical Medical Industries, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 83,388, Oct. 10, 1979, abandoned. This application Jun. 16, 1981, Ser. No. 274,302

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—798 **31 Claims**

1. A flexible self-contained bandage adapted to be applied adjacent to an injured portion of a patient's body, said bandage comprising:

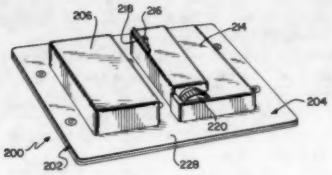
a first unit adapted to be applied to the patient's body;

a second unit removably applied upon said first unit;

said second unit including means for generating and applying a voltage output to said first unit;

said first unit having separated conductive portions;

said voltage output being transmitted through said conductive portions to the patient's body to cause low current



electrical pulses within the patient's body to block or mask the pain arising from the injury.

4,398,546

INSPECTION APPARATUS

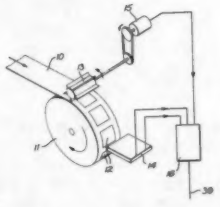
Paul S. Fisher, Carnmoney, and Robert W. McLoughlin, Bangor, both of Northern Ireland, assignors to Gallaher Limited, London, England

Filed Jun. 10, 1981, Ser. No. 272,165

Claims priority, application United Kingdom, Jun. 23, 1980, 8020499

Int. Cl.³ A24C *5/00, 5/20*

U.S. Cl. 131—88 **5 Claims**



1. An inspection apparatus for monitoring patches of material, said apparatus comprising a conveyor for a series of spaced cut patches, a knife adapted to cooperate with said conveyor surface to cut patches from a strip of material fed to said conveyor. a reference signal generator adapted to produce a reference signal representing the time at which said knife performs a cutting operation, a detector unit mounted adjacent to said conveyor downstream of said knife by a distance greater than the largest expected patch length, and adapted to produce a patch signal representing the time at which the leading edge of each of said patches reaches said detector unit, and means for determining whether the delay between said reference signal and said patch signal falls within acceptable limits and for producing an output indicative thereof.

4,398,547

TORUS SMOKING PIPE

Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

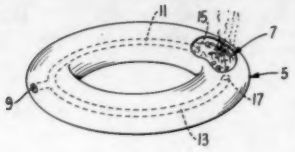
Filed Aug. 19, 1981, Ser. No. 290,170

Int. Cl.³ A24F *1/00, 5/00, 7/00*

U.S. Cl. 131—216 **3 Claims**

1. A smoking pipe comprising a torus shaped article, said torus being disposed in a horizontal plane having a bowl at one

end of the torus and a mouth opening at the opposite end of torus and two smoke passages extending from opposite sides of



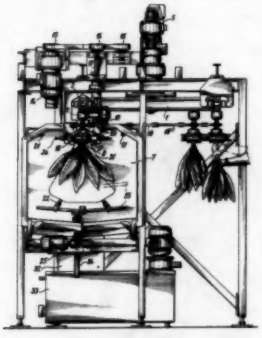
the bowl to opposite sides of the torus leading from said bowl to said mouth opening.

4,398,548

METHOD AND APPAPATUS FOR MOISTENING BUNDLES OF FLEXIBLE MATERIAL IN PARTICULAR BUNDLES OF TOBACCO LEAVES

Cornelis J. M. van Weert, Valkenswaard, Netherlands, assignor to Machinefabriek Wegra B.V., Valkenswaard, Netherlands

Filed Nov. 10, 1980, Ser. No. 205,248
Int. Cl.³ A24B *3/18, 3/04*
U.S. Cl. 131—304 **6 Claims**



1. A method of moistening bundles of leafy vegetation by placing the bundles at the base thereof into a clamping means and passing the same through a moistening space in which there is atomized a liquid, characterized in that said bundles are passed through said space while being suspended from the base thereof and being rotated about the vertical axis of said base.

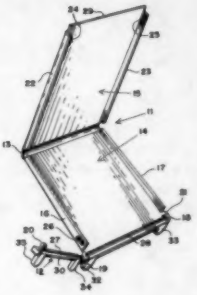
4,398,549

HAIR FROSTING PURSE

Louis N. Thomas, 990 NE. 156 Ter., North Miami Beach, Fla. 33162

Filed Jul. 27, 1981, Ser. No. 286,804
Int. Cl.³ A45D *8/22*
U.S. Cl. 132—9 **5 Claims**

1. A hair frosting or streaking purse comprising, in combination, a substantially rectangular enclosure portion having longitudinally extending sidewalls, a substantially rectangular cover portion hinged at one end to one end of said enclosure portion and movable in closing relation with respect to the inner surface of said enclosure portion, means for releasably clamping hair strands against the inner surface of said enclosure portion at the other end thereof, means for releasably securing said cover portion in said closing relation with respect to the inner surface of said enclosure portion, said enclosure and cover portions being integrally molded of resiliant, structurally strong, synthetic plastic material, said hinge between said enclosure portion and said cover portion comprising a transverse groove permitting relative flexure of said cover portion with respect to said enclosure portion, means for releasably clamping hair strands against the inner surface of said enclosure portion comprising a clamping bar, one end of said clamping bar being hinged to said enclosure portion at one side of said other end thereof, means for releasably securing the other end of said clamping bar against said enclosure portion at said other end thereof and at the side thereof opposite said hinged side, a pair of mutually laterally-spaced projections extending perpendicularly outwardly of each side of said outer



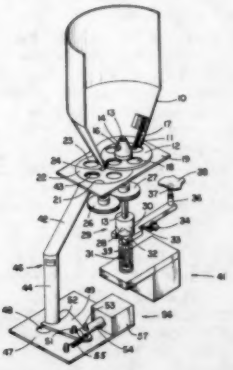
end of said enclosure portion, a second pair of mutually laterally-spaced projections extending perpendicularly outwardly of said ends of said clamping bar, said projections having flat surfaces at their undersides, all of said flat surfaces, upon said other end of said clamping bar being secured against said enclosure portion, all lying in a substantially common plane and being adapted to rest substantially flat against the scalp upon the purse being installed upon the head for supporting the purse in erect position on the scalp during the hair treatment process.

4,398,550

COIN DISPENSING MECHANISM

Phillip E. Shireman, Martinsville, Ind., assignor to Standard Change-Makers, Inc., Indianapolis, Ind.

Filed Apr. 24, 1981, Ser. No. 257,495
Int. Cl.³ G07D *9/04*
U.S. Cl. 133—1 A **10 Claims**



1. Coin dispensing apparatus including first and second plates supported for rotation in stacked overlapping relation, power means for rotating said plates in opposite angular direction about parallel axes normal to the plane of each plate, a

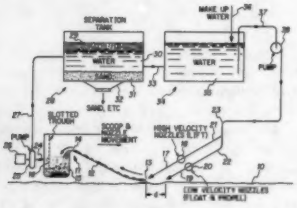
plurality of coin receiving apertures formed in each of said plates with the apertures in each plate arranged equidistant from the respective axis of rotation of the plate, the circles formed by a line joining the aperture centers in said plates being tangential, whereby successive apertures in said plates move into registration as the plates rotate to permit a coin in one of the apertures of said first plate to move into one of the apertures of said second plate with each registration of said plate apertures, and which means are provided for sensing the occurrence of a rotation-impeding coin jam at the interface of said plates and providing a signal to said power means reversing the previous direction and continuing rotation of said plates in the reversed direction until the next jam occurrence sensed by said means provides a signal to said power means again causing reversal and continuing rotation of said plates in the new direction.

4,398,551

HYDRAULIC SURFACE CLEANING APPARATUS

Robert M. Moorehead, Richardson, Tex., assignor to Comar, Inc., Dallas, Tex.

Filed Jul. 30, 1981, Ser. No. 288,527
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—104 **9 Claims**



1. Beach cleaning apparatus comprising; a scoop member including

a bottom plate inclined upwardly from a leading edge of said bottom plate with the trailing edge of said bottom plate terminating in a downwardly disposed trough member,

means for positioning said bottom plate leading edge into juxtaposition with a planar surface to be cleaned,

means for directing a low-velocity water stream at a predetermined acute angle from said planar surface to be cleaned and toward said bottom plate leading edge to impact said planar surface at a predetermined impact point space-separated from said bottom plate leading edge,

means for directing a high-velocity water stream at a predetermined acute angle from said planar surface to be cleaned and toward said bottom plate to an impact point substantially coincident with said bottom plate leading edge, and

means for translating said scoop member in a direction opposite that toward which said water streams are directed and with respect to said surface to be cleaned.

4,398,552

APPARATUS FOR PICKLING THE INNER WALL OF TUBULAR MATERIAL

Yoshiro Tanaka; Noritsugu Fujii; Kazuo Akagi, and Ryujiro Shitamatsu, all of Shimonoseki, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

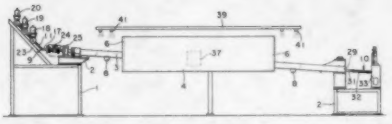
Filed Oct. 1, 1981, Ser. No. 307,675
Claims priority, application Japan, Aug. 12, 1981, 56-127146
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—57 R **17 Claims**

1. An apparatus for pickling the inner water of at least one tubular member, comprising;

a support table for demountably supporting the tubular member in an axially inclined position;

a water tank mounted on the support table for allowing the tubular member to extend therethrough;

pickling liquid-supplying means operatively associated with the water tank for charging a pickling liquid into the tubular member;



recovery means disposed in rear of the water tank for recovering the pickling liquid which has been used and has flowed out from the rear end of the tubular member; and

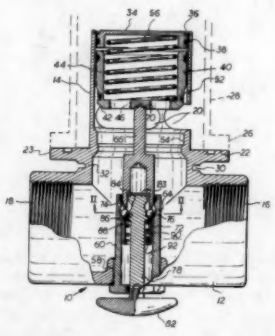
means disposed in the water tank for measuring the inner diameter of the tubular member by ultrasonic waves, said measuring means and said pickling liquid-supplying means being interlocked for controlling the supply of the pickling liquid.

4,398,553

TEE VALVE ASSEMBLY

Neill D. Perrine, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 27, 1981, Ser. No. 325,231
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **8 Claims**



1. A valve for interconnecting a tank with a fluid line wherein the tank includes an access opening encompassed by a mounting surface, in combination, a hollow body having a fluid line port having a longitudinal axis, a tubular extension defined upon said body having an axis transverse to said port axis, a mounting surface defined on said body about said extension whereby said extension is receivable within the tank opening and said body mounting surface engages the tank mounting surface, said extension including a side wall, an opening defined in said side wall, a valve axially movably within said extension between a closed position sealing said opening with respect to the interior of said extension and an open position permitting flow through said opening, first and second pressure faces defined upon said valve both exposed to fluid pressure within said body wherein pressure upon said first face when said valve is in the closed position forces said valve toward said closed position and pressure upon said second face forces said valve toward said open position, said first face having a greater area than said second face whereby the greater pressure on said valve is in the direction toward said closed position, a manually operated valve actuator mounted

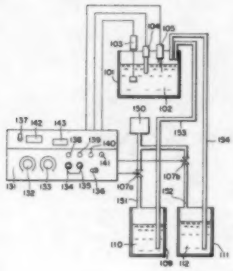
upon said body operatively connected to said valve controlling movement of said valve between said open and closed positions, and locking means associated with said actuator selectively locking said actuator in a position to maintain said valve in said open position.

4,398,554

FLUX CONTROL DEVICE

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,437
Int. Cl.³ G05D *11/08*
U.S. Cl. 137—91 **5 Claims**



1. In a flux control device including a vessel for containing a liquid flux, a first reservoir for storing a concentrated flux, a second reservoir for storing a diluent, means for checking the specific gravity and surface level of the liquid flux in the vessel for any deviations from predetermined ranges, and means for selectively feeding the concentrated flux and diluent to the vessel from the first and second reservoirs in such a manner as to maintain the specific gravity and the surface level of the liquid flux in the vessel within the predetermined ranges, the improvement comprising said feeding means which includes:

a source of pressurized gas;

first and second gas-liquid feed assemblies coupled to the first and second reservoirs, respectively, each feed assembly having an outer pipe and an inner pipe defining a liquid passage therein and placed inside of the outer pipe to define a gas passage therebetween, said gas passage having one end thereof in open communication with the upper space within said respective reservoir and the other end in communication with said pressurized gas source, and said liquid passage having one end thereof in communication with the liquid in said respective reservoir and the other end in communication with said vessel;

means to removably mount each of the first and second gas-liquid feed assemblies on each of the first and second reservoirs, the mounting means including a first retaining element pivotally supported adjacent to an end portion of the outer pipe received within the reservoir, the retaining element pivotal about an axis substantially orthogonal to the longitudinal axis of the outer pipe, and a clamping member threadedly engaging the exterior surface of the outer pipe and adjustably movable along the outer pipe to clamp the first retaining member against the reservoir wall; and

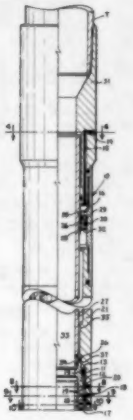
means for selectively communicating said gas passages of said first and second gas-liquid feed assemblies with said pressurized gas source so that the concentrated flux and the diluent may be fed to said vessel through respective liquid passages when said first and second reservoirs are selectively communicated with said pressurized gas source through respective gas passages.

4,398,555

FLOW CONTROL VALVE

Donald F. Taylor, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 3, 1981, Ser. No. 269,992
Int. Cl.³ F04F *1/08*
U.S. Cl. 137—155 **14 Claims**



1. A valve for use in a flow conductor, comprising:

a. tubular housing connectable in a flow conductor having a plurality of longitudinally spaced lateral ports in the wall thereof communicating the exterior with the interior;

b. annular seat means in said housing spaced longitudinally from said lateral ports;

c. valve closure means slidably mounted in said housing and having a seating surface thereon engageable with said annular seat means, said valve closure means being movable between on-seat and off-seat positions to control flow of fluids through said lateral ports and between the exterior and the interior of said housing;

d. means for moving said valve closure means between said on-seat and off-seat positions; and

e. flow restrictor means on said valve closure means movable therewith relative to said lateral ports and said seat means, including a plurality of external flanges which cooperate with said plurality of lateral ports to selectively restrict the flow of fluids entering said housing through said ports.

4,398,556

FIRE HYDRANT COVER

Eloy Pereira, 3400A Paul Ave., Bronx, N.Y. 10468, and Arnold N. Lefkowitz, 247 W. Drake Ave., New Rochelle, N.Y. 10805

Filed Jul. 29, 1981, Ser. No. 288,102
Int. Cl.³ E03B *9/06, 9/14*
U.S. Cl. 137—296 **24 Claims**

1. A cover for a fire hydrant that includes a valve body having a valve stem extending upwardly therefrom, said cover comprising:

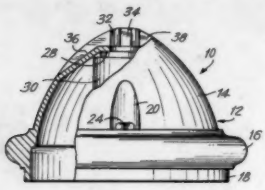
a cup-shaped dome defined by a wall that is adapted to be positioned over and around the valve body;

means for coupling said dome to the fire hydrant;

an opening in said dome for rotatably receiving a tool that is adapted to mate with and angularly displace the valve stem between open and closed positions; and

elongated and downwardly sloping drainage means formed in the outer surface of the wall of said dome, said drainage means having a first upper end positioned at a location proximate the valve stem and a second lower end positioned at a location opposite a portion of the valve body,

said drainage means being further defined by side wall means connected to each other such that all surfaces of said drainage means are completely open to the atmosphere and face away from the interior of said dome throughout their entire length whereby fluid and/or debris can drain therefrom without collecting.

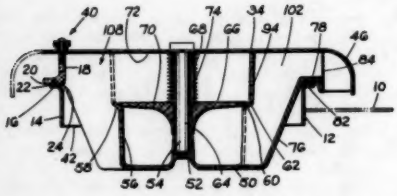


4,398,557

COMBINATION VACUUM RELIEF VALVE AND PRESSURE RELIEF VALVE

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,813
Int. Cl.³ F16K *17/196*
U.S. Cl. 137—493.9 **10 Claims**



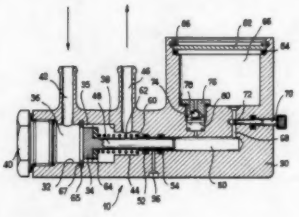
1. A combination vacuum relief valve and pressure relief valve assembly for use in a tank comprising: cover plate support means extending upwardly from fixed structure on a railway tank car; resilient means biasing a top cover plate into engaged position with said support means; said cover plate being movable between a closed position engaging said support means and preventing fluid communication between the tank and the outside atmosphere, and an open position wherein said cover plate moves upwardly against the bias of said resilient means, and wherein fluid communication is permitted between the tank and the outside atmosphere; a vacuum relief valve mounted horizontally and spaced below said top cover plate; means biasing said valve into closed position engaging a valve seat located below said top cover plate and below said valve; said valve in said closed position closing communication between the inside of the tank and the outside atmosphere, and in open position allowing communication between the tank and the outside atmosphere; a plurality of first passageways providing fluid communication between the lower surface of the valve and the outside atmosphere; a plurality of second passageways spaced from said first passageways providing fluid communication between the inside of the tank and the upper surface of said valve when said valve is in closed position; said first and second passageways being located below said top cover plate; the cross sectional area of said first passageways throughout their length being at least substantially equal to the cross sectional area of said valve and the cross sectional area of said second passageways through their length being at least substantially equal to the cross sectional area of said valve; whereby when the pressure inside the tank becomes less than atmospheric pressure, atmospheric pressure will cause the valve to move upwardly away from its seat and allow air to enter the tank and whereby when the pressure in the atmosphere and in the tank are substantially equalized, the valve will return to the seated position; and whereby for a given available valve cross sectional area the volume of air flow into the tank from the atmosphere is maximized for a given pressure drop from the atmosphere into the container.

4,398,558

SAFETY VALVE FOR VACUUM CONTROL CIRCUITS

Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy

Continuation of Ser. No. 121,077, Feb. 13, 1980, abandoned.
This application Jun. 22, 1981, Ser. No. 276,128
Claims priority, application Italy, Feb. 14, 1979, 20176 A/79
Int. Cl.³ F16K *17/34*
U.S. Cl. 137—498 **3 Claims**



1. In a safety valve for use in a vacuum system to isolate an auxiliary circuit from a vacuum generator should a leak occur in the auxiliary circuit, said safety valve comprising:

a housing having a chamber and a blind bore, said blind bore having a first end and a second end therein, said chamber having an inlet port connected to said auxiliary circuit and an outlet port connected to said vacuum generator, said housing having a valve seat located between the inlet and outlet ports;

a flow-responsive movable member located between said inlet and outlet ports;

a first valve member connected to said movable member upstream said valve seat;

a stop member located in said chamber;

resilient means for biasing said movable member toward a first rest position against stop member in which said first valve member is away from said valve seat;

a piston located in said blind bore, said piston being connected to said movable member;

a first conduit for connecting the first end of said blind bore to a reservoir;

a second conduit for connecting the second end of said blind bore to the reservoir, said reservoir, first and second conduits and blind bore forming a closed circuit which allows fluid to flow between the reservoir and said blind bore, said movable member responding to a predetermined rate of air flow from the auxiliary circuit through the chamber by overcoming said resilient means to move said first valve member from said first rest position toward said valve seat and said piston from a second rest position past said second conduit and toward said first conduit, said piston movement communicating fluid from said blind bore to said reservoir through said first conduit;

first and second seals located in said blind bore and engaging said piston to separate said chamber and blind bore;

a drain port located between said first and second seals to provide a flow path to the surrounding environment for any fluid that may seep past said first seal from said blind bore and thereby avoid fluid contamination of said chamber by said fluid;

a restriction member located in said first conduit for controlling the flow rate of fluid between said blind bore and reservoir, said restriction member being adjustable to

control said flow rate and correspondingly the time required to move said valve into engagement with said valve seat to interrupt communication of air to said vacuum generator; and

a second valve member located in said second conduit to prevent fluid flow from said blind bore toward said reservoir while allowing free flow of fluid from said reservoir to said blind bore of movement of the piston toward said second rest position to assure that the bore is full of fluid at all times.

4,398,559

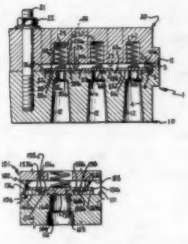
VALVE MEMBER AND ASSEMBLY WITH INLET AND OUTLET PRESSURE RELIEF GROOVES

Stuart E. Bunn, and Herbert B. Owsley, both of Shawnee Mission, Kans., assignors to Ball Valve Company, Inc., Olathe, Kans.

Continuation-in-part of Ser. No. 191,015, Sep. 26, 1980, Pat. No. 4,350,179. This application Sep. 21, 1982, Ser. No. 420,819

Int. Cl.³ F16K *15/06*

U.S. Cl. 137—516.15 **22 Claims**



1. A valve member for selectively closing a fluid passage including inlet and outlet portions in a valve assembly having a valve seat, which comprises:

(a) a valve member face engaging said valve seat to define a contact area therebetween when said valve member is in a closed position;

(b) said contact area having inlet and outlet peripheral edges at said passage inlet and outlet portions respectively;

(c) an inlet pressure relief groove extending along said valve member face from said inlet peripheral edge to an interior portion of said contact area;

(d) an outlet pressure relief groove extending along said valve member face from said outlet peripheral edge to said contact area interior portion; and

(e) said contact area including a sealing portion whereat said valve member face and said valve seat are in engagement for substantially preventing the flow of fluid between said passage inlet and outlet portions.

4,398,560

MULTIPLE SHUT-OFF VALVE

Kenneth C. Black, Site E, Rte. 2, Nanaimo, British Columbia, Canada V9R 5K2

Filed Apr. 10, 1981, Ser. No. 252,910

Int. Cl.³ F16K *31/44*

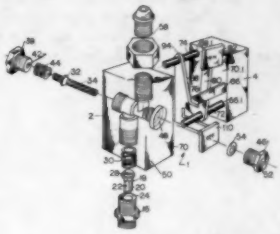
U.S. Cl. 137—595 **11 Claims**

1. A valve apparatus for simultaneously shutting off or opening two gas supplies, the apparatus comprising:

(a) two valve bodies for mounting a distance apart from each other, each said body having an internal conduit therethrough for the passage of gas, and a lift valve within the conduit for closing or opening the conduit with reciprocation of the valve, the lift valve having a valve stem engagable externally from said each valve body, the lift valve being resiliently biased towards a closed position;

(b) a pair of spaced-apart, parallel shafts between the valve bodies, each said shaft being fitted at each end in an aperture in one of the valve bodies and axially slidable within said apertures, permitting said distance between the valve bodies to be varied;

(c) a manually movable first lever fitted on a first of the shafts, the first lever having a member connected thereto for engaging the valve stems, and a detent, the first lever being pivotable between an open position where the member engages the valve stems to open the lift valves and a shut-off position where the lift valves are closed; and



(d) a manually movable second lever fitted on a second of the shafts for pivotting about the second shaft, the second lever having a notch for engaging the detent when the first lever is in the open position, the second lever being pivotable so the notch disengages from the detent, the first lever returns to the shut-off position, and the lift valves close.

4,398,561

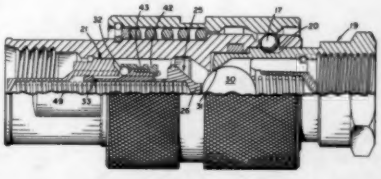
QUICK DISCONNECT COUPLING WITH LOCKED VALVING

Ojars Maldavs, Lincoln, Nebr., assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Filed Mar. 27, 1981, Ser. No. 248,399

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.05 **3 Claims**



1. A quick disconnect coupling with locked valving comprising a tubular body having a port at one end for connection to a source of hydraulic fluid and collar means at the other end for connection to the male half of a coupling associated with a hydraulically operated implement, said body adjacent said implement and being equipped with a valve seat, a relatively elongated tubular guide fixedly mounted within said body extending axially thereof from said source end, relatively elongated valve element slidably mounted in said guide and extending axially of said body toward said implement end and equipped with a valve head at the implement end thereof, means in said guide resiliently urging said valve head into seating engagement with said seat, an annular groove in the outer wall of said valve element, a plurality of balls in said groove and projecting radially outwardly therefrom, a plurality of ball supporting openings in said guide, one for each ball and aligned with said groove, said groove having a predetermined axial length and equipped with a ramp at the groove end adjacent said body implement and at such position that when said valve element is moved toward open position by engagement with the closed valve of the male half, said balls emerge

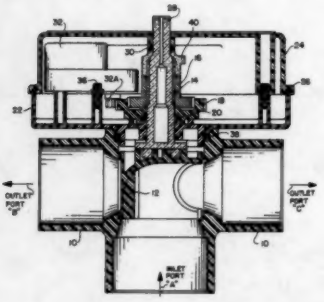
from said groove, a flow sensitive sleeve slidably mounted on said guide between said groove and said valve head and having a portion adapted to overlie said balls and block the emergence thereof from said groove, spring means interposed between said sleeve and guide resiliently urging said sleeve toward said implement end to position said sleeve portion out of blocking relation with said balls, said spring means being so sized and constructed as to permit movement of said sleeve toward said source end at a predetermined rate of fluid flow toward said source end and thereby position said sleeve portion in blocking relation with said balls and thereby prevent emergence of the same while said flow rate persists and thus preventing said valve head from engaging said seat.

4,398,562

MOTORIZED DIVERTER VALVE

Myrl J. Saarem, and Donald E. Lovelace, both of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Jul. 6, 1981, Ser. No. 280,269
Int. Cl.³ F16K *31/04*; H02P *7/78*
U.S. Cl. 137—625.47 **5 Claims**



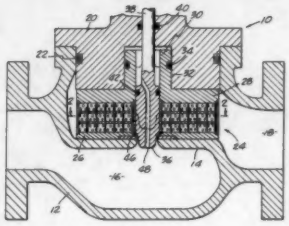
1. A diverter valve assembly including a body defining a single inlet port and a pair of outlet ports; a housing mounted on said body; a drive shaft mounted on said body and extending into said housing to be rotatable about a particlar axis; a diverter member mounted in said body on one end of said drive shaft to be turned by said drive shaft selectively to divert fluid from said inlet port to respective ones of said outlet ports as said shaft is rotated about said particular axis; a pair of drive motors mounted in said housing on opposite sides of said drive shaft; means including a gear coaxially mounted with respect to said drive shaft for coupling respective ones of said drive motors to said drive shaft; a cam mounted on said drive shaft within said housing for rotation with said drive shaft; switching means mounted in said housing in position to be operated by said cam when the drive shaft is turned from a first predetermined angular position to a second predetermined angular position in which said inlet port is coupled to one of said outlet ports by said diverter member, and when said drive shaft is turned from said second pre-determined angular position to said first predetermined angular position in which said inlet port is coupled to the other of said outlet ports by said diverter member; and means electrically connecting said switching means to said motors to cause said motors to be deenergized each time the switching means is operated by said cam.

4,398,563

MULTI-TUBE FLOW RESTRICTOR

George Kay, Anaheim, and Alan Keskinen, Van Nuys, both of Calif., assignors to Vacco Industries, South El Monte, Calif.

Filed Sep. 28, 1981, Ser. No. 306,134
Int. Cl.³ F15D *1/02*
U.S. Cl. 138—42 **25 Claims**



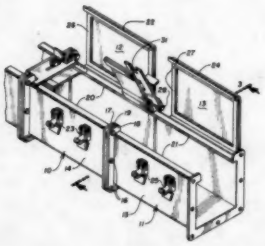
14. A flow restrictor for pressurized fluid comprising:
a tier of an annular array of perforated tubelets;
a pair of solid annular plates between which said tubelets are fixedly held in eccentric parallel relationship, the opposite ends of said tubelets being closed by said pair of plates;
a perforated sleeve at the radially inner edge of said plates and said annular array of tubelets; and
a perforated band at the outer edge of said plates and said annular array of tubelets.

4,398,564

SEALED LAY-IN WIREWAY

Steven J. Young, Oakdale; Gary K. Semmel, Anoka, and Terry L. Munich, Princeton, all of Minn., assignors to Federal Cartridge Corporation, Minneapolis, Minn.

Filed Sep. 31, 1981, Ser. No. 303,828
Int. Cl.³ H02G *3/04, 3/06*
U.S. Cl. 138—92 **12 Claims**



1. In a lay-in wireway:
(a) a pair of channel members connected end-to-end and having corresponding open sides through which wiring may be placed within said members;
(b) covers hingedly connected to said channel members and constructed and arranged to close the open sides of their respective channel members;
(c) a movably mounted sealing plate pivotally connected with at least one of said channel members and constructed and arranged to extend transversely across the open sides of said channel members at the connected ends thereof; and
(d) means for sealing the joints between said channel members and said covers, the joints between said channel members and said sealing plate, and the joints between said sealing plate and said covers when the latter are closed;

(e) said means including said sealing plate and mechanism for moving said sealing plate upwardly into sealing position relative to the underside of said covers when the latter are closed;

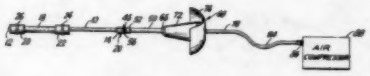
(f) said covers and said sealing plate being constructed and arranged to be moved without dissembly to open position to permit unobstructed placement of wiring in said channel members.

4,398,565

PIPE PLUGGING APPARATUS

Geronimo C. Williamson, 535 Lafayette Ave., Brooklyn, N.Y. 11205

Filed Aug. 21, 1981, Ser. No. 295,098
Int. Cl.³ F16L *55/12*
U.S. Cl. 138—93 **10 Claims**



1. Apparatus for plugging a pipe comprising:

an inflatable bag insertable into a pipe in a collapsed condition and inflatable to block any flow within the pipe;

A hollow tube having at least one closed end, said hollow tube being provided with air input means and air outlet means, said air outlet means of said hollow tube being disposed within said inflatable bag, said air outlet means including at least one opening longitudinally spaced along said hollow tube spaced from said closed end of said hollow tube;

said inflatable bag including an elastic sleeve surrounding said hollow tube and covering said opening of said air outlet means;

securing means for connecting said sleeve around said hollow tube, said securing means being disposed on end portions of said sleeve to secure said sleeve on said hollow tube;

connecting tube means for interconnecting said air input means of said hollow tube to an air compressor for transmission of compressed air through said hollow tube to inflate said sleeve and thereby plug the pipe;

valve means coupled between said air input means of said hollow tube and said connecting tube means for controlling the flow of air into and out of said sleeve; and

a band of elastic material overlying each end portion of said sleeve for protecting said sleeve from said securing means and for limiting inflation of said sleeve.

4,398,566

PIPE THREAD PROTECTOR APPARATUS

Harlo W. Janzen, Box 356, Fairview, Okla. 73737

Filed Jul. 27, 1981, Ser. No. 287,254
Int. Cl.³ B65D *59/00*
U.S. Cl. 138—96 T **16 Claims**

1. A thread protector apparatus for protecting pipe threads comprising:

an annular elastomeric sleeve;

stop means extending radially inwardly from one end of the sleeve; and

a constricting subassembly connected to the sleeve for constricting the elastomeric sleeve about an externally threaded pipe end, said constricting subassembly including:

a flexible band extending around and embedded within the elastomeric sleeve; and

a shortening device engaging the flexible band for shortening its effective length to thereby constrict the flexible band and the annular elastomeric sleeve, said shortening device including:

drum means located within the elastomeric sleeve and engaging at least one end of the band for drawing the band to a constricted status, said drum means comprising:

a housing embedded within the elastomeric sleeve, said housing including:

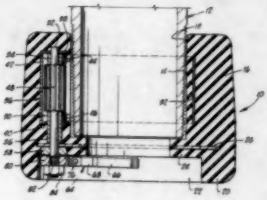
a top wall;

a bottom wall;

guide flanges projecting toward each other from the top and bottom walls and guidingly contacting an end portion of said flexible band;

a pair of opposed, parallel side walls;

a back wall interconnecting said side walls and said top and bottom walls; and



a pair of rigid stabilizer wings projecting from opposite side walls of the housing into the elastomer of said sleeve; and

a sprocket drum within said housing and including teeth engaging slots spaced along said one end of the flexible band;

an operator shaft drivingly connected to the drum for rotating the drum, and including an end projecting from the end of the sleeve carrying the stop means and parallel to the axis of the sleeve; and

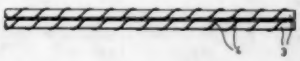
operator handle means pivotally and detachably connected to the operator shaft for rotating the operator shaft and drum to shorten and constrict the flexible band.

4,398,567

CONDUIT DEVICE

Thorleif Möll, Fjäras, Sweden, assignor to Cinderella AB, Stockholm, Sweden

Filed Oct. 15, 1980, Ser. No. 197,330
Claims priority, application Norway, Oct. 15, 1979, 793313
Int. Cl.³ F16L *9/18*
U.S. Cl. 138—113 **4 Claims**



1. A device for conducting a first fluid in heat transfer relationship with a second fluid, comprising a plurality of conduits each containing the first fluid; an outer pipe carrying the conduits and containing a second fluid flowing around the conduits; and a thread shaped element helically wrapped substantially around each of the conduits with the the element windings around each conduit longitudinally spaced from each other to cause the second fluid flowing around the conduit to perform a circulating motion, said element having substantially an entire length and a surface thereof in continuous contact with the conduit, said element being at least partially spaced apart from said outer pipe along a common longitudinal plane extending radially through the conduit, enabling fluid to flow therebetween, said conduits being substantially parallel to the longitudinal axis of said outer pipe and spaced apart from each other radially toward the outer pipe by means of the helically

extending elements wherein said windings of each element are offset axially relative to corresponding windings provided on an adjacent conduit, said windings on one conduit thereby contacting an adjacent conduit to radially space adjacent conduits from each other in the outer pipe a distance substantially equal to the diameter of an element interposed therebetween, said windings defining a continuous clearance between adjacent conduits extending substantially the entire axial length of said elements, enabling second fluid flow between adjacent conduits through the continuous clearance.

4,398,568

APPARATUS FOR STOPPING AND RESETTING A LOOM

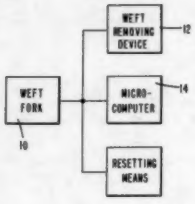
Sten A. O. Rydborn, Klöxhultsvägen 21, 343 00 Älmhult, Sweden

Continuation of Ser. No. 80,904, Oct. 1, 1979. This application Apr. 2, 1981, Ser. No. 250,326

Claims priority, application Sweden, Oct. 20, 1978, 781093

Int. Cl.³ D03D *47/00*

U.S. Cl. 139—1 R **1 Claim**



1. In a shuttleless loom including means for holding warp threads, means for holding weft threads, a weft selector for moving a selected weft thread to a gripping position, at least one rapier for gripping the selected thread at the gripping position and moving with the gripped thread across the loom and through the warp shed to form woven material on the loom, and weft signaling means for sensing the movement of weft thread from the weft holding means to the gripping position and across the loom and for generating a signal in the absence of such movement, the improvement comprising means responsive to the signal from the weft signaling means at the time the rapier is moving across the loom for preventing the weft selector from moving the selected weft thread to the gripping position to prevent the rapier from gripping the thread, whereby the rapier moves across the loom without the weft thread.

4,398,569

DEVICE FOR SUPPORTING A HEALD FRAME IN A WEAVING LOOM

Hajime Suzuki, Anjo; Yoshifumi Umemura, Toyoake, and Shigeru Tanaka, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

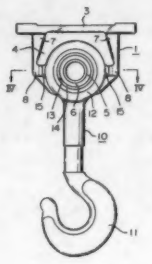
Filed Jun. 2), 1981, Ser. No. 278,072

Claims priority, application Japan, Jun. 30, 1980, 55-92519[U]

Int. Cl.³ D03C *13/00*

U.S. Cl. 139—88 **6 Claims**

1. A device for supporting a heald frame in a weaving loom comprising: a bracket which is fixed on the heald frame; and a hanger which is connected to a spring for supporting said heald frame or to a flexible transmitting member connected to a driving mechanism for driving said heald frame and which is separatably coupleable to said bracket, wherein, one member of said bracket and hanger has a supporting shaft projecting from the surface thereof, and the other member of said bracket and hanger has an engaging hole formed therein, with which said supporting shaft turnably engages; and one member of said bracket and hanger has at least one engaging projection formed at the periphery thereof, and the other member of said bracket and hanger has at least one abutting projection formed



in a U-shape at the periphery thereof which has an engaging space therein, said engaging projection being capable of being inserted into said engaging space.

4,398,570

WEFT YARN DETECTOR

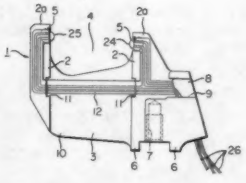
Hajime Suzuki, Anjo; Yoshimi Iwano, Ohbu, and Akio Arakawa, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 11, 1981, Ser. No. 242,682

Claims priority, application Japan, Mar. 15, 1980, 55/34140

Int. Cl.³ D03D *51/34*

U.S. Cl. 139—370.2 **13 Claims**



1. A weft yarn detector for detecting weft yarn inserted into a weft yarn passage formed by a series of weft yarn guide members mounted on a slay of a loom, said detector comprising:

a weft yarn detecting body adapted to be mounted directly on a slay of a loom, said body including two supporting portions to be disposed opposite to each other on opposite sides of a weft yarn guide passage in the mounted position of said body;

weft yarn detecting elements mounted on said two supporting portions; and

a flexible, thin printed wiring plate mounted on said body and including means electrically connected to said detecting elements for electrically connecting said detecting elements to an external control system.

4,398,571

SLIDE FASTENER STRINGER AND METHOD OF MAKING SAME

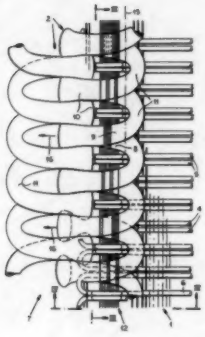
Alfons Fröhlich, Essen, Fed. Rep. of Germany, assignor to Opti Patent-, Forschungs- und Fabrikations-AG, Riedern-Allmeind, Switzerland

Filed Jun. 11, 1981, Ser. No. 272,471

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022032

Int. Cl.³ D03D *1/00*; A44B *19/34*

U.S. Cl. 139—384 B 4 Claims



1. A method of making a slide fastener stringer comprising the steps of:

weaving a continuous band consisting of at least one woven support tape and a continuous monofilament coupling element disposed along an edge of said tape with the support tape consisting of round warp yarns interwoven with a continuous ground weft yarn inserted into the warp as double weft insertions, said coupling element having a row of coupling members each formed with a coupling head projecting beyond said edge and a pair of shanks extending from each head over said edge whereby one of said shanks is disposed substantially directly over the other shank of each pair, and arcuate bights connecting each shank of a respective coupling member with shanks of adjacent coupling members, and binding warp yarns overlying the shanks for retaining said coupling element on said tape, each of said binding warp yarns having a repetitive weave pattern including the spanning of a pair of coupling members and forming a warp yarn bridge thereacross, said double weft insertions including weft yarn loops engaging said bridges and retaining said binding warp yarns away from the rearmost portion of said bights;

at spaced locations along said tape removing said rearmost portion of said bight from said coupling element thereby freeing a corresponding number of coupling members from the coupling element; and

withdrawing the freed coupling members to gap said coupling elements at said location while leaving said binding warp yarns intact, each of said loops being engaged over all of the binding warp yarns between each pair of coupling members to pad the space therebetween.

4,398,572

HOOPER MECHANISM FOR CONNECTING STEEL BANDS

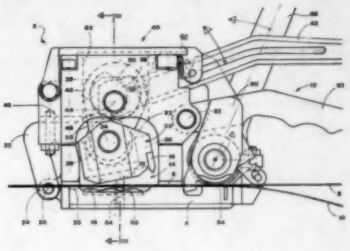
Peter Fromm, Uitikon, Switzerland, assignor to Fromm AG, Spreitenbach, Switzerland

Filed Aug. 3, 1981, Ser. No. 289,178

Claims priority, application Switzerland, Aug. 8, 1980, 6032/80

Int. Cl.³ B21F *9/02*

U.S. Cl. 140—93.2 11 Claims



1. Hooper apparatus for joining a pair of steel bands comprising: band tensioning means for engaging a pair of overlapping steel bands inserted into said apparatus to hold said bands in a joiner position; and punching and stamping tool means for connecting said overlapping steel bands together, said punching and stamping tool means comprising an upper tool section and a lower tool section adapted to receive said steel bands therebetween, a driving mechanism including a cam portion for moving said upper tool section relative to said lower tool section, a base plate having said lower tool section arranged thereon, and a tool support having said upper tool section attached thereto, said tool support being constructed as a rocker mechanism, wherein said tool support is pivotally mounted about an axis which lies perpendicular to the direction of the steel bands and at least approximately in an active plane defined by said punching and stamping tool means.

4,398,573

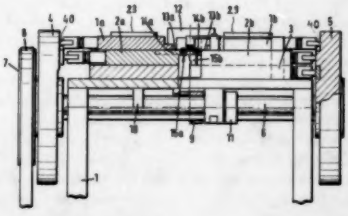
APPARATUS FOR THE FORMING, SHAPING AND CUTTING OF CONTACT LEADS OF ELECTRONIC COMPONENTS

Ferdinand Kreid, Speicherstrasse 3, Karlsbad 1, Fed. Rep. of Germany 7516

Continuation of Ser. No. 134,177, Mar. 26, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,014

Int. Cl.³ B21F *1/00*

U.S. Cl. 140—105 5 Claims



1. Apparatus for forming, shaping and cutting of contact leads of electronic components, which contact leads extend from said components, said apparatus comprising: a support frame; axially spaced synchronous cam wheels mounted opposite each other on a common shaft and having cam surfaces at

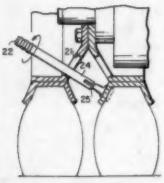
their side faces facing each other and being rotatably mounted on said support frame; a plurality of tools each being slidably supported by said frame between said cam wheels so as to be operated thereby, said slidably supported tools being biased into engagement with the cam surfaces of the respective cam wheels; said cam wheels being adapted to provide, upon rotation with said shaft, for timed operation of said slidably supported tools as they are forced by the associated cam surfaces to their working positions for the forming, shaping and cutting of said contact leads; means disposed between, and operated by, said cam wheels for engaging said electronic components in said apparatus with said leads extending therefrom in a predetermined manner and feed means for supplying said components to said apparatus, said feed means being operated synchronously with said cam wheels for cyclic operation of said feed means with said tools.

4,398,574

METHOD FOR INFLATING DUAL PNEUMATIC TIRES

Ira V. Moore, 25540 B Lynn Pl., Madera, Calif. 93638

Filed Oct. 28, 1981, Ser. No. 315,927
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **1 Claim**



1. The method of adding pressured air to dual pneumatic tires wherein both tires have valve stems through which air is added and on which is threaded a mud cap, the method comprising the steps of:

providing an elongated first tool having an end forming a cavity for fitting over and grasping the mud cap;

placing the elongated first tool in position over said mud cap and twisting the first tool to screw said mud cap off of said stem;

removing the first tool and mud cap from said pneumatic tire;

providing a second elongated tool comprising a hollow tube having a first end forming an air intake and a second end forming a cavity for fitting over said valve stem and having gripping means released by pushing on said air intake while pulling on said hollow tube;

placing said second elongated tool second end over said valve stem while pushing on said air intake and pulling on said hollow tube and then releasing said hollow tube to allow said gripping means to grip said valve stem and hold said second tool in place;

placing a source of air in contact with said air intake to supply air to said pneumatic tire, and then removing said air source;

pushing on said air intake while pulling on said hollow tube to release said gripping means;

removing said second tool from said valve stem;

replacing said mud cap with said first tool and screwing said mud cap on said valve stem; and

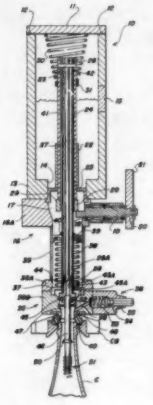
removing said first tool from said mud cap.

4,398,575

FILLER TUBE WITH CHECK VALVE FOR CONTAINER FILLING DEVICES

Harold J. Brandon, Festus, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed Jun. 26, 1981, Ser. No. 277,811
Int. Cl.³ B65B *3/26, 31/00*
U.S. Cl. 141—39 **2 Claims**



1. In a container filler apparatus providing a source of a liquid product, a pressurizing medium and a connection between the source of liquid product and a container to receive the liquid product, the improvement of a valve assembly in said connection comprising:

(a) a filling head body formed with a passage for the flow of the liquid product toward the container, said flow passage being formed with a seat surface;

(b) sleeve means connecting said filling head body flow passage with the liquid product source;

(c) valve body means having an internal passage extending therethrough from a valve seat at one end of said internal passage, said valve body means being formed on its exterior with a valve for engaging on said flow passage seat surface;

(d) second sleeve means extending from the pressurizing medium source through said liquid product passage for connection to said valve body means, said sleeve means isolating the internal passage in said valve body means from the liquid product flow on the exterior thereof;

(e) pressurizing medium vent means connected to said valve body means to form a continuation of said internal passage in said valve body means;

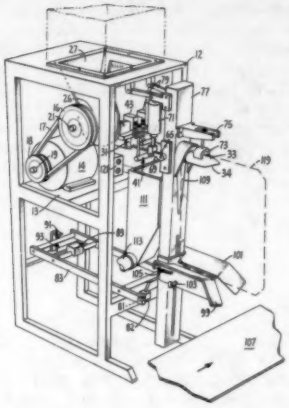
(f) valve means operable in said sleeve means cooperating with said valve seat at said one end of said valve body means internal passage for selectively opening and closing said internal passage to the flow of pressurizing medium to said vent means; and

(g) second valve means carried by said vent means in position to enter the container, said valve means having coiled means grasping the exterior of said vent means and extending therebeyond with open turns to form a cage, and a valve element captured in said cage but movable away from said vent means by gravity to admit pressurizing medium to flow into the container and movable to close said vent means to the reverse flow of pressurizing medium in response to the rise of liquid product in the container for closing said vent means to liquid product.

4,398,576
PACKER-FILLER MACHINE

Edric W. Vredenburg, Sr., P.O. Box 135, Fortine, Mont. 59918

Filed Aug. 20, 1981, Ser. No. 294,476
Int. Cl.³ B65B 3/04
U.S. Cl. 141—68 7 Claims



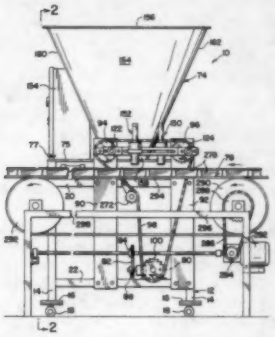
1. A packer-filler machine comprising in combination:
(a) impeller means for forcing material from a source,
(b) a nozzle for discharging said material into a bag to be filled,
(c) the said nozzle being movable from a first horizontal position to a second tilted position wherein the terminal end of said nozzle is tilted downwardly,
(d) fixed clamp means mounted above the terminal end of said nozzle and spaced therefrom so that a bag is engaged between the terminal end of said nozzle and said fixed clamp when said nozzle is in a horizontal position and said bag is released when said nozzle is in a tilted position,
(e) means for holding said nozzle in a horizontal position while a bag is being filled, and
(f) means for releasing said bag from engagement between the terminal end of said nozzle and said fixed clamp by tilting said nozzle downwardly when said bag is filled.

4,398,577
FLOWABLE PRODUCT METERING AND DISPENSING MACHINE

Robert L. Sauer, 5826 W. Glenn Dr., Maple Heights, Ohio 44137

Filed Aug. 28, 1980, Ser. No. 182,143
Int. Cl.³ B65B 3/04
U.S. Cl. 141—135 54 Claims

47. The improvement in a device to process measured amounts of a flowable product into receptacles comprising: a transportable sanitary rectangular frame of welded seamless stainless steel tubing; pneumatic programming means; a chemical impervious plastic housing for said programming means; and a sanitary stainless steel product reservoir, all mounted on said frame; a sanitary acrylic plastic transparent distribution manifold having a cylindrical spool valve chamber; a first pair of ports interconnecting said reservoir and said valve chamber; a second pair of ports extending from said valve chamber to the exterior of said manifold; a pair of plungers in said second pair of ports; a pair of pneumatic cylinders adapted to reciprocate said plungers; a pair of slotted plates secured to said frame, said pair of cylinders being adapted to be releaseably secured to said pair of plates for shifting along said slots to permit insertion and withdrawal of said plungers from said manifold; a pair of product dispensing heads; a third pair of ports interconnecting said valve chamber and said pair of dispensing heads; a spool valve in said valve chamber programmed to sequentially open and close said first and third pairs of ports; said pair of pneumatic cylinders being programmed to reciprocate said pair of plungers in timed relationship with the opening and closing of said first and third pairs of ports to draw a measured amount of product from said reservoir into said valve chamber when said first pair of ports are open and said third pair of ports are closed, and to move said product from said valve chamber to said pair of dispensing heads when said first pair of ports are closed and said third pair of ports are open; said pair of dispensing heads being programmed to open when said third pair of ports are open and to close when said

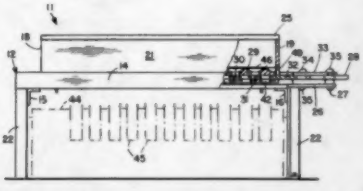


third pair of ports are closed; said pair of dispensing heads being mounted on a fixture; means to orbit said fixture; means to open said dispensing heads after approximately 90° of orbit from top dead center and to close said dispensing heads after approximately 150° to 180° of orbit from top dead center; means thereafter to air pulse said dispensing heads to remove product residue from said dispensing heads after said closing thereof; cam means to actuate said programming means; means to convey receptacles beneath said dispensing heads; and means to drive said cam means in synchronization with the conveyance of said receptacles.

4,398,578
DISTRIBUTOR FOR GRAVEL AND SEEDS

Gerald A. Walters, Kaneohe, and Donovan Goo, Kailua, both of Hi., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 16, 1981, Ser. No. 254,682
Int. Cl.³ B65B 1/04
U.S. Cl. 141—238 11 Claims



11. A device for distributing solid particles of material comprising a support, first horizontal plate means fixedly mounted on said support and formed with a plurality of material-discharge aperatures arranged in a predetermined geometrical configuration, second horizontal plate means fixedly mounted above said first plate means and having a plurality of material-receiving apertures arranged in the same configuration but displaced horizontally with respect to said discharge aperture configuration, middle horizontal plate means slidably disposed

between said first and second horizontal plate means and having a configuration of apertures registrable alternately with said first and second-named configurations in two respective predetermined registration positions of said slidable middle plate means, guide means on the support constraining said middle plate means to horizontal movement between said registration positions, and lever means connecting said middle plate means and said support and being arranged to move the middle plate means between said registration positions responsive to operation of said lever means, said support comprising a horizontal frame having a plurality of depending supporting legs defining a space beneath the frame;

a rack of receiving containers movably disposed beneath the frame in said space and arranged in a geometrical configuration substantially identical with and registering with the material-discharge apertures,

said support means further provided with means for adjustably clampingly securing said second plate means relative to said first plate means whereby slidable middle plate means of varying thicknesses can be accommodated,

said geometrical configuration comprising rectilinear rows and columns of apertures,

said receiving apertures having downwardly receiving surfaces,

said guide means comprising a rectangular bin mounted on said support, said first and second plate means fitting in said bin, said middle plate means slidably fitting between two opposite longitudinal walls of said bin, and wherein said middle plate means has an extension projecting movably through a transverse wall of said bin.

means of limiting sliding movement of said middle plate means substantially to the path of travel required for motion between said two registration positions,

said middle plate means being formed with a rectilinear slot of a length substantially equal to and extending parallel to said path of travel, and wherein said limiting means comprises fixed pin means secured to said support and extending through said slot, and

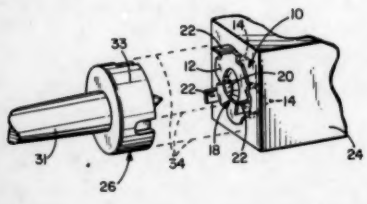
said lever means pivoted to said support being provided with link means connecting the lever means to said extension of the middle plate means.

4,398,579

LATHE WORK CENTERS

Robert A. Holdahl, Hopkins, and Paul S. Petersen, Minnetonka, both of Minn., assignors to Toolmark Co., Minneapolis, Minn.

Filed Mar. 20, 1981, Ser. No. 245,887
Int. Cl.³ B23B *33/00*
U.S. Cl. 142—53 **2 Claims**



1. A device for centering a workpiece on a tool center, the device comprising:

a workpiece centering member formed integrally from a single piece of metal, and including a flat annular main ring portion having a side surface defining a reference plane, a peripheral edge and an integral centering seat portion;

a plurality of drive lugs integral with the ring portion attached to the peripheral edge and projecting away from the reference plane in a first direction;

a plurality of spurs integral with the ring portion adjacent the peripheral edge and projecting from the plane in a second direction opposite from the first direction; and

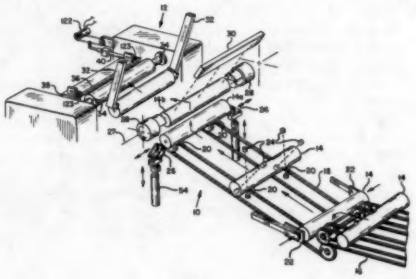
the integral centering seat portion being formed about a central axis and having portions spaced outwardly from the central axis projecting from the ring portion in the first direction along the axis, and further being formed in a direction back toward the reference plane on portions of the centering seat portion adjacent the central axis to thereby form an integral annular generally frusto conical seat surface of desired length concentric with the peripheral edge and the central axis, the seat surface terminating on the same side of the reference plane as the ring to prevent penetration of the seat surface into a workpiece and to limit penetration of a center member with which the workpiece centering member is used.

4,398,580

VENEER LATHE LOG CHARGER SYSTEM HAVING ENHANCED ACCURACY AND RATE OF PRODUCTION

Fred Sohn, Roseburg, and Kenneth L. Shrum, Glide, both of Oreg., assignors to Sun Studs, Inc., Roseburg, Oreg.

Filed May 28, 1981, Ser. No. 267,796
Int. Cl.³ B27L *5/02;* **G01B** *9/02*
U.S. Cl. 144—357 **11 Claims**



10. A method for charging a veneer lathe comprising:

(a) scanning the shape of an elongate log with a first scanner and determining the location of a preliminary longitudinal axis of said log for optimum production of veneer;

(b) moving said log from said first scanner to a position wherein said preliminary longitudinal axis of said log is in a predetermined alignment with respect to a log-engaging device by supporting said log intermediate the ends thereof in a generally V-shaped supporting surface having a predetermined included angle within which said log is supported, engaging said opposing ends of said log with a loading device and moving said log from said V-shaped supporting surface along a rectilinear path substantially bisecting said included angle;

(c) engaging the opposing ends of said log with said log-engaging device while said log is in said position;

(d) scanning the shape of said log with a second scanner while said log is engaged by said log-engaging device and determining the location of a final longitudinal axis of said log for optimum production of veneer; and

(e) transferring said log from said log-engaging device to a position wherein said final longitudinal axis of said log is aligned with the rotational axis of said veneer lathe.

4,398,581

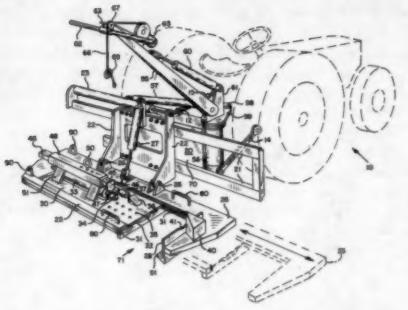
TREE PROCESSING APPARATUS

Warren A. Aikins, 3489 Indian Creek Dr., and Thomas N. Melin, 1424 24th Ave., both of Longview, Wash. 98632

Filed Jul. 20, 1981, Ser. No. 285,156

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—366 **17 Claims**



1. A tree processing apparatus adapted for mounting on the end of a tractor comprising a support frame having laterally extending support rails for a lateral adjustment frame slidable thereon, a shear blade frame hinged to said lateral adjustment frame, said shear blade frame having an anvil plate at one end thereof and a shear blade slidable toward and away from said anvil plate, said shear blade frame having pivotal movement on said hinge to a first working position approximately parallel to the ground surface for felling trees and to a second working position approximately perpendicular to the ground surface for cutting the trunks of felled trees to desired lengths, said lateral adjustment frame being slidable on said support rails to side shift said shear blade frame and align an opening between said anvil plate and the retracted shear blade with a tree to be felled, a wedge on said lateral adjustment frame being operable to side shift said opening in said shear blade frame between said anvil plate and retracted shear blade beyond one side of the tractor to cut the trunk of a felled tree alongside the tractor, said shear blade frame in said second working position having an approach side and a rear side relative to said felled tree trunk, and a splitter wedge and cylinder mount on said rear side of said shear blade frame with said wedge confronting the end of said felled tree trunk, said shear blade serving as an anvil for splitting said tree trunk.

4,398,582

PNEUMATIC TIRE

Kazuaki Yuto, Higashimurayama; Toru Oniki, Higashikurume; Nobumasa Ikeda, and Itsuo Miyake, both of Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,552

Claims priority, application Japan, May 23, 1980, 55-67916

Int. Cl.³ B60C *11/00*; C08K *3/04*

U.S. Cl. 152—209 R **3 Claims**

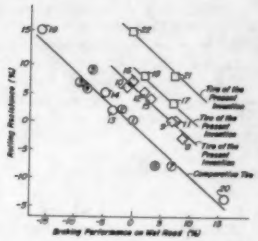
1. A pneumatic tire having a tread, at least the ground-contact area of which is formed of a rubber composition consisting essentially of 100 parts by weight of a mixed elastomer and 40–80 parts by weight of furnace carbon black,

said mixed elastomer consisting of

10–60 parts by weight of a solution-polymerized styrene-butadiene copolymer rubber having a bonded styrene content of 5–30% by weight and a trans-1,4 bond content in the butadiene unit of not more than 45% by weight,

10–50 parts by weight of an emulsion-polymerized styrene-butadiene copolymer rubber having a bonded styrene content of 30–50% by weight, and

0–80 parts by weight of at least one rubber having a glass transition temperature Tg of not higher than −50° C., which is selected from the group consisting of natural rubber, synthetic polyisoprene rubber, polybutadiene rubber and an emulsion-polymerized styrene-butadiene copolymer rubber having a bonded styrene content of 18–28% by weight; and


Rolling Resistance (%)
Braking Performance on Wet Road (%)
Tire of the Present Invention
Tire of the Present Invention
Tire of the Present Invention
Comparative Tire

said furnace carbon black having a specific surface area (N_2SA) of 85–95 m^2/g measured by the nitrogen adsorption method, a dibutyl phthalate absorption value (24M4 DBP) of 100–110 ml/100 g, a tinting strength (TINT) of 95–105 and a half value width (ΔD_{50} (ST)) of at least 180 mμ in the size distribution curve of the aggregates.

4,398,583

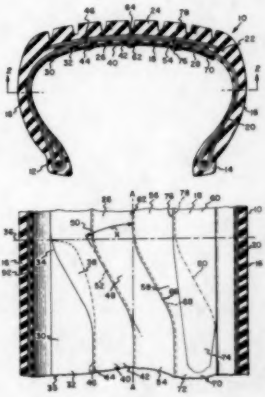
TIRE AND METHOD OF APPLYING SEALANT

William R. Casey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 23, 1981, Ser. No. 323,934

Int. Cl.³ B60C *19/12, 21/08*; B32B *31/00*; G01M *1/00*

U.S. Cl. 152—347 **16 Claims**



1. A pneumatic tire rotatable about an axis and having an annular body of resilient rubberlike material with a pair of bead portions, a crown portion and sidewalls between said bead portions and said crown portion, a puncture sealing layer underlying said crown portion and comprising a continuous strip of puncture sealing material adhered to an inside surface of said crown portion, a first end portion positioned at a first axial location, a first turn of said continuous strip being laid and adhered circumferentially of said tire in an annular configuration at said first axial location and overlapping said first end portion, a first crossing portion of said continuous strip extending generally angularly to a circumferential centerline of said tire across said continuous strip to a second axial location in side-by-side relation with said continuous strip in said first axial

location, at least a second turn of said continuous strip laid and adhered circumferentially of said tire to said inside surface in an annular configuration at said second axial location and an end portion of a last turn of said continuous strip overlapping a part of said last turn providing additional weight in said last turn for balancing the additional weight in said first turn due to the overlapping of said first end portion.

10. A method of applying a puncture sealing layer to an underside of a pneumatic tire rotatable about an axis and having a toroidal shape with sidewalls extending between a pair of annular bead portions and a crown portion comprising layer and adhering a first end of a continuous strip of puncture sealing material to an inside surface of said tire at a first circumferential position on said tire, laying and adhering at least a first turn of said continuous strip circumferentially of said tire in an annular configuration at a first axial location, overlapping said first end portion at said first axial location, laying and adhering a first crossing portion of said continuous strip extending generally angularly of a circumferential centerline of said tire across said continuous strip in said first axial location to a second axial location in side-by-side relation with said continuous strip in said first axial location, laying and adhering at least a second turn of said continuous strip circumferentially of said tire in an annular configuration at said second axial location and then overlapping a part of a last turn of said continuous strip with an end portion of said last turn providing additional weight in said last turn for balancing the additional weight in said first turn due to the overlapping of said first end portion.

4,398,584

PNEUMATIC RADIAL TIRES FOR HEAVY VEHICLES

Hikaru Tansei, Higashimurayama, and Kenichi Motomura, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,699
Claims priority, application Japan, Dec. 24, 1979, 54-167863
Int. Cl.³ B60C *15/00*
U.S. Cl. 152—362 CS **12 Claims**

1. In a pneumatic radial tire for heavy vehicles comprising a carcass composed of at least one ply of cords, each being arranged in a radial plane inclusive of the rotary axis of the tire or inclined at an extremely small angle with respect to the radial plane, the carcass being wound around a bead core from the inside toward the outside thereof to form a turnup portion to sandwich a rubber stock disposed on the bead core, the improvement comprising; a bead portion reinforcement containing at least two metal cord layers each arranged toward the outside of the bead core and containing cords crossed with the cords of the carcass ply, said metal cord layers having different heights in their upward ends as measured from a reference line parallel to the rotary axis of the tire passing through the center of the bead core toward the radial direction of the tire and having cords with substantially the same modulus of elasticity, the height of the upward ends of cords of said metal cord layers lowering outwardly toward the axial direction of the tire and, the cords of said metal cord layers crossed with each other such that the cords of each of the metal cord layers are inclined at a larger angle with respect to the radial plane of the tire as the heights of the upward ends decrease.

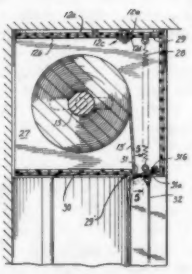
7. In a pneumatic radial tire for heavy vehicles comprising a carcass composed of at least one ply of cords,each being arranged in a radial plane inclusive of the rotary axis of the tire or inclined at an extremely small angle with respect to the radial plane, the carcass being wound around a bead cord from the inside toward the outside thereof to form a turnup portion to sandwich a rubber stock disposed on the bead core, the improvement comprising; a bead portion reinforcement containing at least three organic fiber cord layers each arranged toward the outside of the bead core and containing cords crossed with the cords of the carcass ply, said organic fiber cord layers having different heights in their upward ends as measured from a reference line parallel to the rotary axis of the tire passing through the center of the bead core toward the radial direction of the tire and having cords with substantially the same modulus of elasticity, the height of the upward ends of cords of said organic fiber cord layers lowering outwardly toward the axis direction of the tire and, the cords of said organic fiber cord layer, crossed with each other such that the cords of each of the organic fiber cord layers are inclined at a larger angle with respect to the radial plane of the tire as the heights of the upward ends decrease.

4,398,585

THERMALLY EFFICIENT WINDOW SHADE CONSTRUCTION

Richard A. Marlow, 85 E. End Ave., New York, N.Y. 10028

Filed Feb. 16, 1982, Ser. No. 349,015
Int. Cl.³ E04F *10/06*
U.S. Cl. 160—23 R **8 Claims**



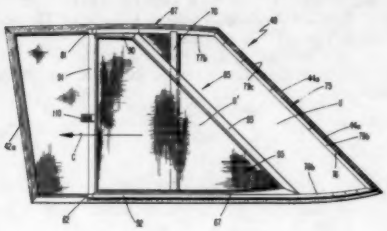
1. A thermal isolating shade assembly comprising in combination, a header box, a roller shade member mounted in said box, for movement between extended and convoluted positions, said shade being normally urged to said convoluted position, an access slot formed in the bottom of said box, said shade projecting downwardly through said slot, a shutter blade mounted to said box, said blade extending a transverse distance substantially coextensive with the width of said shade, and including a seal surface movable toward and away from said slot, spring means yieldingly urging said blade toward said slot to thereby clamp substantially the entirety of the width of said shade between a wall defining said slot and said seal surface to define a transverse seal area with said shade and clamp said shade against movement from said extended to said convoluted position, and release means operatively connected to said shutter manually actuable to shift said shutter away from said slot to thereby release said shade for return movement to said convoluted condition.

4,398,586

DEMOUNTABLE VEHICLE WINDOW SCREEN

James Hall, 2727 N St. SE., Washington, D.C. 20019

Filed Mar. 2, 1981, Ser. No. 239,659
Int. Cl.³ E06B *9/00*
U.S. Cl. 160—105 **6 Claims**



1. A detachable screen for covering a vehicle access opening communicating with an interior passenger cabin, said screen having an aperture and carrying a sliding screen portion for selectively covering and uncovering said aperture, comprising:

(a) a first rigid frame having top and bottom curvilinear members and a side curvilinear member respectively dimensioned to engage and cover weather stripping elements surrounding said window opening;

(b) a track guide having upper and lower, U-shaped channel members each having parallel side walls and a bottom wall defining a track therebetween, one of said side walls being attached in vertical partially overlapping position in relation to the height of said first frame members on the inner side thereof, said track guides thereby projecting in the direction of the cabin and longitudinally along said top and bottom first frame members to define recessed areas extending lengthwise along a portion of said first frame members respectively, said recessed areas being located between an outer surface of the channel bottom wall and an edge of the top and bottom first frame members, said track guide being dimensioned to locate the recessed area in engagement with said weather stripping elements outside the vehicle window opening;

(c) screen material carried by and intermediate a portion of the first frame, defining a screened portion and unscreened portion intermediate said first frame;

(d) a second rigid frame having similar curvilinear members as said first frame, said second frame dimensioned for retention and sliding movement within said track guides so that each track receives entirely therein a corresponding edge of the second frame enabling the second frame to be entirely disposed within the plane defined between the upper and lower channel members, said second frame and channel members projecting towards the cabin from said first frame toward said vehicle window opening;

(e) screen material carried by and intermediate the second rigid frame, dimensioned to substantially cover the unscreened portion when positioned oppositely said unscreened portion; and

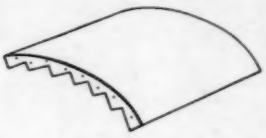
(f) barbed fastening means having a plurality of resiliently deformable projections secured to and projecting outwardly from a surface including the recessed area of said first frame, said projections adapted for mating with a plurality of resiliently deformable corresponding projections secured to the weather stripping elements of said access opening, thereby enabling easy attachment of said detachable frame to substantially cover said vehicle opening by aligning said recessed areas with said weather stripping elements and by pressing the recessed areas into flush contact with the weather stripping elements.

4,398,587

RADIANT ENERGY REFLECTOR DEVICE

Michael D. Boyd, 30 Cowper St., Ainslie, Australian Capital Territory, Australia

Continuation of Ser. No. 917,370, Jun. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 746,844, Dec. 2, 1976, abandoned. This application Oct. 2, 1980, Ser. No. 193,134
Int. Cl.³ E06B *9/262, 9/30*
U.S. Cl. 160—178 R **11 Claims**



1. A radiant energy screen bounded by, inter alia, an imaginary outer surface and an imaginary inner surface, said screen comprising a plurality of slats, each slat being lamellar and of elongate form, characterized in that:

(a) each slat has a plurality of retro-reflective structures embodied within the slat;

(b) the retro-reflective structures incorporate a body of material which is transparent to radiant energy, the outer surface of said body of transparent material forming one face of the structures;

(c) each slat, in use, is inclined at an angle relative to the said imaginary outer surface.

4,398,588

METHOD OF MAKING A RIM-STABILIZED STEEL INGOT

Paul E. Hamill, Jr., Penn Township, Westmoreland County, and Robert H. Kachik, Washington Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 2, 1981, Ser. No. 230,191
Int. Cl.³ B22D *7/00, 7/10*
U.S. Cl. 164—53 **5 Claims**

1. A process for producing a rim-stabilized steel ingot comprising:

(a) teeming a rimming-type steel into an ingot mold until said mold is substantially full,

(b) allowing the teemed steel to rim in the ingot mold for a period of from ½ to 15 minutes,

(c) thereafter adding an aluminum-exothermic material mixture to the top of the molten metal in the ingot mold, said mixture containing sufficient particulate aluminum as will at least semi-kill the molten steel in the ingot core and a stoichiometric blend of fuel and oxidizing agent sufficient to melt and superheat the particulate aluminum,

(d) and allowing the heat from the molten steel in the ingot mold to ignite the exothermic mixture so that the exothermic reaction will (1) melt and superheat the particulate aluminum, (2) melt any ingot surface scum therebeneath, and (3) drive the molten, superheated aluminum into the ingot core.

4,398,589

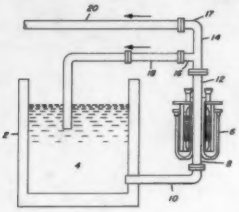
PUMPING AND METERING DEVICE FOR FLUID METALS USING ELECTROMAGNETIC PUMP

Donald Eldred, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sep. 25, 1981, Ser. No. 305,524
Int. Cl.³ B22D *39/00*
U.S. Cl. 164—337 **7 Claims**

1. Apparatus for delivering fluid metal to a casting machine comprising:

a reservoir for containing fluid metal and having an outlet;
electromagnetic pump means having an inlet and an outlet, with said inlet connected to the outlet of said reservoir; and
a conduit connected to the outlet of said pump means and having
(a) a first outlet positioned at a first level and effective for



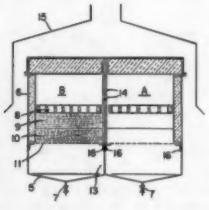
returning metal to said reservoir whenever said pump means is operating above a first predetermined flow rate, and
(b) a second outlet positioned at a level above said first outlet and effective for directing metal to said casting machine only when said pump means is operating at a second predetermined flow rate higher than said first predetermined flow rate.

4,398,590

HEAT EXCHANGER WITH REVERSING FLOW CYCLE FOR THE RECOVERY OF HEAT FROM FURNACE SMOKE

Michel Leroy, St. Jean de Maurienne, France, assignor to Aluminum Pechiney, Lyons, France

Filed Jan. 5, 1981, Ser. No. 222,674
Claims priority, application France, Jan. 9, 1980, 80 00662
Int. Cl.³ F28D *17/00*
U.S. Cl. 165—4 **9 Claims**



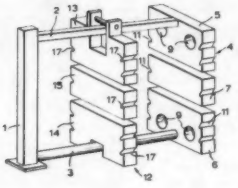
1. A recovery-type heat exchanger for the indirect transfer of heat between a hot gaseous fluid and a cold gaseous fluid which flow in opposite directions, said heat exchanger comprising two heat exchange units that function alternately as a heating unit and a heated unit; at least one bed of ceramic particles positioned within each heat exchange unit, a portion of the bed including acid resistant particles; a perforated support in each heat exchange unit for holding the bed of ceramic particles; means for creating a counterflow of the two gaseous fluids so that the hot gaseous fluid can pass to the heated unit through the upper portion of the bed and, upon cooling, can flow through the perforated support and from the lower portion of said bed before passing from the heat exchanger, whereas the cold gaseous fluid can pass to the heating unit through the lower portion of the bed and the perforated support and, once heated, can pass from the upper portion of said bed before passing from the heat exchanger; means for measuring the temperature of at least one of the gaseous fluids; and means for rapidly reversing the direction of the hot and cold gaseous fluids in response to the temperature of the fluids in a continuous cycle, the time of each half-cycle being from 10 to 13 seconds whereby the temperature at a given point in the bed varies only ±50° C. from an average value.

4,398,591

HEAT EXCHANGER FRAME COMPONENTS

Michael P. Bond, Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed Jan. 22, 1981, Ser. No. 227,374
Claims priority, application United Kingdom, Jan. 29, 1980, 8002979
Int. Cl.³ F20F *7/00*
U.S. Cl. 165—78 **12 Claims**



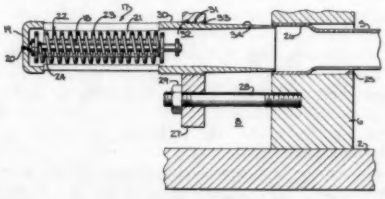
1. A frame element for a plate heat exchanger frame, said frame comprising a head, an end stop, a top rail extending between the end stop and the head, and a follower mounted on the top rail whereby a pack of plates may be suspended on the top rail and compressed between the head and the follower to form the heat exchanger: characterized in that the frame element, selected from the head and follower, consists of two or more separate slab form members having means to connect them.

4,398,592

BASKET RETAINER FOR HEAT EXCHANGER TUBE CLEANING ELEMENT

Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 18, 1982, Ser. No. 350,286
Int. Cl.³ F28G *1/12, 15/02*
U.S. Cl. 165—95 **11 Claims**



1. In combination in a heat exchanger having a housing, and having a plurality of longitudinally extending fluid flow tubes disposed within said housing, and having tube sheets disposed within said housing and with said tube sheets having openings in communication with the ends of said tubes, and further having longitudinally extending baskets for receiving shuttling tube cleaning elements:
(a) a retaining plate fixedly disposed in spaced relationship to the outer face of a said tube sheet,
(b) and means, including said retaining plate, mounting a said basket in fixed relationship to said tube sheet and to an end of a said tube.

4,398,593

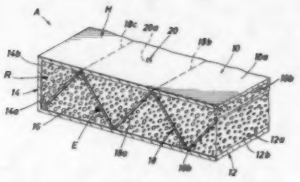
HEATER PLATE ASSEMBLY

Dominic L. Casinelli, deceased late of Houston, Tex. James E. Harrell, legal representative by, assignor to James E. Harrell, Houston, Tex.

Continuation of Ser. No. 187,604, Sep. 15, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,192

Int. Cl.³ F28D 7/02; F24H 7/00; C09K 3/18

U.S. Cl. 165—104.11 3 Claims



1. A heater plate assembly for heating with heat retained from an external heat source, comprising:

a plate housing formed having an internal cavity, said plate housing adapted to be heated by external heat source;

said plate housing including an upper planar plate and a lower planar plate, said upper and lower plates separated by said internal cavity and enclosed by sidewall plates;

said upper, lower and sidewall plates formed of impervious metal and secured into a fluid tight enclosure surrounding said internal cavity;

heat retaining means disposed in said internal cavity of said plate housing for retaining heat from the external source for subsequent retained heating of said plate housing, said heat retaining means including glass beads packed within said internal cavity except for the open spaces between adjacent glass beads in contact with one another;

said heat retaining means including phenanthrene for binding said glass beads together for enhanced heat retention, and said phenanthrene substantially filling the open spaces between said glass beads;

heat transfer enhancement means disposed in said internal cavity for enhancement of heat transfer to and from said heat retaining means;

said heat transfer enhancement means including a heat conductive member in contact with said upper plate, said lower plate and said heat retaining means within said internal cavity;

said heat conductive member including a corrugated metal plate disposed within said internal cavity in engagement with said upper plate and lower plate of said plate housing; and

vent means in communication with said internal cavity and with said plate housing to permit venting of any gas pressure within said internal cavity during heating of said plate housing.

4,398,594

APPARATUS FOR USE IN CARRYING OUT A PHYSICAL AND/OR CHEMICAL PROCESS, FOR EXAMPLE A HEAT EXCHANGER

Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil BV, Amsterdam, Netherlands

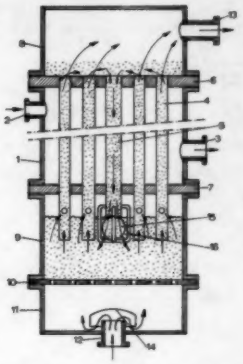
Filed May 7, 1982, Ser. No. 376,024

Claims priority, application Netherlands, May 12, 1981, 8102308

Int. Cl.³ F28D 13/00

U.S. Cl. 165—104.16 6 Claims

1. In apparatus for use in carrying out a physical and/or chemical process having a plurality of upwardly extending riser tubes for upward flow of a liquid and upper and lower chambers into which said tubes open at their upper and lower ends respectively, the apparatus containing a granular mass which is fluidized by the upward flow of the said liquid so as to occupy at least the riser tubes, and there being at least one return tube for the return of the granular mass from the upper chamber to the lower chamber and valve means hindering the passage of liquid through said return tube, the improvement



that said valve means is a single valve having a valve member adjacent to and movable relative to the lower end of the return tube.

4,398,595

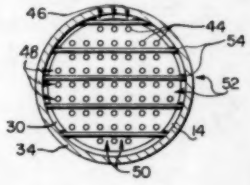
VORTEX GENERATORS

William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 264,529, May 18, 1981, which is a division of Ser. No. 98,576, Nov. 28, 1979, Pat. No. 4,311,187. This application Aug. 30, 1982, Ser. No. 413,104

Int. Cl.³ F28F 9/24

U.S. Cl. 165—109 R 11 Claims



1. Apparatus comprising:

(a). a plurality of parallel tubes arranged to form at least a first and second plurality of parallel tube rows with lanes between adjacent tube rows;

(b). a ring surrounding said plurality of tubes in a plane about normal to said plurality of tubes;

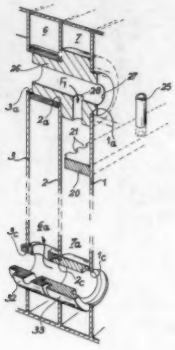
(c). a plurality of non-supportive vortex generators affixed to and spaced across said ring, forming chords across a first end of said ring, each of said plurality of non-supportive vortex generators extending between two different adjacent tube rows of said first plurality of parallel tube rows; and

(d). support means cooperating with the plurality of parallel tubes in the first and the second plurality of parallel tube rows to support the tubes in the first and second plurality of parallel tube rows.

4,398,596
PLATE-TYPE HEAT EXCHANGERS

Fernand Lauro; Bernard Manon, both of Grenoble, and Gerard Marie, Eybens, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 2, 1979, Ser. No. 63,333
Claims priority, application France, Aug. 9, 1978, 78 23474
Int. Cl.³ F28F *3/08*
U.S. Cl. 165—167 **3 Claims**



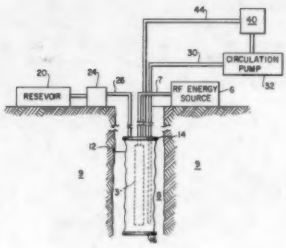
1. An improvement to the plate-type heat exchangers-/evaporators constituted in per se known manner by a stack of a plurality of rectangular plates each having four orifices in the vicinity of the apices of the rectangle and thus constituting juxtaposed parallelepipedic racks, alternately traversed in countercurrent by the hot fluid and the cold fluid, said cold racks having at their apex located in the vicinity of the cold fluid intake a strip having flow holes defining a cold fluid supply chamber and an evaporation chamber where the cold fluid evaporates by flowing as thin trickles in contact with the hot wall, the four orifices of each plate serving respectively for the admission and discharge of the cold and hot fluids, wherein the cold fluid intake is provided with a fitting or lining of a thermally insulating material which serves to create, by reducing the intake diameter, a supplementary pressure drop for said cold fluid and brings about a greater thermal gradient between said cold fluid and the hot plates in the supply pipe.

4,398,597
MEANS AND METHOD FOR PROTECTING APPARATUS SITUATED IN A BOREHOLE FROM CLOSURE OF THE BOREHOLE

John P. Haberman, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,697
Int. Cl.³ E21B *36/04*
U.S. Cl. 166—57 **8 Claims**

1. An improvement to an apparatus for the in-situ recovery of hydrocarbons from an oil shale deposit wherein an RF antenna is entered into a borehole traversing the oil shale deposit and is energized so as to heat the oil shale deposit, comprising inflatable, non-conductive means encompassing said RF antenna for protecting the antenna, and

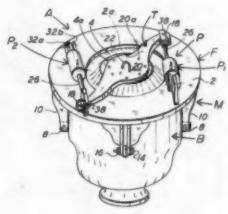


means for inflating said inflatable means so as to prevent portions of the heated oil shale deposit from contacting said RF antenna.

4,398,598
BREAK-OUT TOOL FOR ANNULAR TYPE BLOW-OUT PREVENTERS

Joe H. Fabrygel, Rte. 1, Box 424, West Columbia, Tex. 77486

Filed May 18, 1981, Ser. No. 264,641
Int. Cl.³ E21B *19/16, 33/06*
U.S. Cl. 166—85 **8 Claims**



1. An apparatus for removing the head of an annular type blow-out preventer comprising;

(a) a frame adapted to be mounted over the head of an annular type blow-out preventer, such preventer head being threadedly attached to the body of the annular type blow-out preventer, said frame having a central opening which is adapted to leave a central, top portion of said blow-out preventer head exposed;

(b) mount means for mounting said frame on to said annular type blow-out preventer body, said mount means including a plurality of depending mounting flanges which extend into connection with lugs on said preventer body;

(c) a torque arm adapted to be secured to the preventer head for movement with said preventer head; and

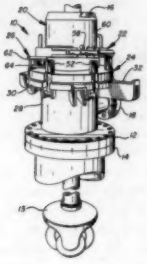
(d) torque applying means mounted with said frame and extending into engagement with said torque arm for applying torque to said torque arm, which transmits said torque to said preventer head attached thereto for breaking the threaded connection between said preventer head and body.

4,398,599

ROTATING BLOWOUT PREVENTOR WITH ADAPTOR

Edwin G. Murray, Odessa, Tex., assignor to Chickasha Rentals, Inc., Midland, Tex.

Filed Feb. 23, 1981, Ser. No. 236,761
Int. Cl.³ E21B *33/068, 33/06*
U.S. Cl. 166—95 **10 Claims**



1. In a rotating blowout preventor of the type having an axial passageway for extending a rotating member therethrough, a lateral passageway in fluid communication with the lower end of the axial passageway; and, a removable rotating head assembly which forms the upper marginal end of the rotating blowout preventor; the improvement comprising:

said rotating blowout preventor includes a main body having an upper end opposed to a lower end, and a sidewall to which said lateral passageway is affixed; mount means at the lower end of said main body by which the rotating blowout preventor can be connected to the upper end of a casing;

an adaptor having an upper end opposed to a lower end; mount means at the lower end of said adaptor by which said adaptor is removably affixed to the upper end of said main body; means at the upper end of said adaptor by which the lower marginal end of said rotating head assembly is removably affixed within the adaptor;

said adaptor is bisected by a plane which lies parallel to the axial centerline of the axial passageway, thereby leaving adjacent circumferentially extending wall members which have longitudinal edges abuttingly engaging one another to provide a closed chamber when the rotating blowout preventor is in the operative configuration; whereby, one wall member can be moved from the other wall member of the adaptor to enable a relatively large drill bit to be received through the main body, and thereby enable a relatively large drill bit to be used in conjunction with a relatively small rotating head assembly;

said adaptor has an axial passageway having a mean inside diameter which is larger respective to the axial passageway formed through the rotating head assembly and smaller respective to the axial passageway passing through the main body;

whereby; when the adaptor walls are moved apart, a drill bit having an outside diameter which does not exceed the outside diameter of the main body axial passageway can be received within the casing.

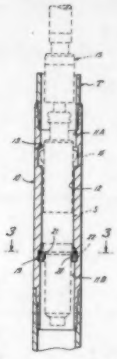
4,398,600

SYSTEMS FOR LANDING WIRE LINE TOOLS AT SELECTED LEVELS WITHIN A WELL TUBING STRING

Gonzalo Vazquez, Houston, Tex., assignor to Ava International Corporation, Houston, Tex.

Filed Dec. 4, 1980, Ser. No. 212,856
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—206 **2 Claims**

1. For use in a system in which wire line tools are adapted to be landed at selected levels within a well tubing string, an assembly comprising first and second wire line tools both having seals thereabout of equal diameter and latches for latching the tool in landed position within said string, said first tool having a shoulder above and of larger diameter than its seal, said second tool having a shoulder below and of lesser diameter than its seal, a nipple connectible as part of a well tubing string and having a bore therethrough in which either of said first and second tools may be landed, said bore having a polished section with which the seal about whichever tool is landed therein is sealably engageable, a first seat in the bore



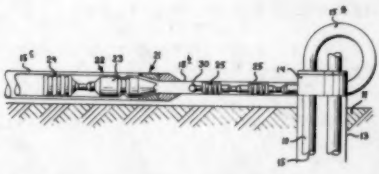
above and of larger diameter than the polished section to land said first tool when the shoulder thereof is lowered into engagement therewith, a groove in the bore beneath the polished section, a ring releasably disposable within the groove to provide a second seat of smaller diameter than said polished section to land said second tool when the shoulder thereof is lowered into engagement therewith, and a recess in the bore to receive a latch on whichever tool which is landed therein.

4,398,601

PARKING TOOL FOR PUMPDOWN WELL COMPLETION SYSTEM

Kenneth L. Schwendemann, Lewisville, and Olen R. Long, Celina, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 27, 1981, Ser. No. 228,894
Int. Cl.³ E21B *23/08*
U.S. Cl. 166—217 **10 Claims**

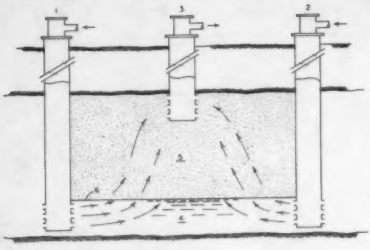


1. A parking tool for releasably coupling first and second tool train sections together in a pumpdown well servicing system comprising: a tool housing including an annular locking collet for releasably locking said tool in a landing nipple along a flowline; a central mandrel telescopically engaged in said housing for longitudinal movement between release and coupling positions including a coupling collet for connection with a first of said tool train sections at said coupling position and release from said first tool train section at said release position; said locking collet being at a release position when said coupling collet is at a locking position; said locking collet being at a locking position when said coupling collet is at a release position; and means for connecting said housing with the second of said tool train sections.

4,398,602
GRAVITY ASSISTED SOLVENT FLOODING PROCESS

Maynard L. Anderson, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1981, Ser. No. 291,748
Int. Cl.[3] E21B *43/24, 43/30*; 166 *273*
U.S. Cl. 166—245 14 Claims



1. A method for recovering viscous petroleum from subterranean petroleum containing formations penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the petroleum containing formation comprising the steps of:

a. drilling and completing at least to the top of the petroleum containing formation at least one intermediate well between the injection and production wells, where said intermediate well has fluid communication with the petroleum containing formation;

b. while the intermediate wells are colsed in, injecting via said injection well and into the lower part of the petroleumcontaining formation a hydrocarbon solvent where said solvent has a specific gravity less than that of the formation petroleum;

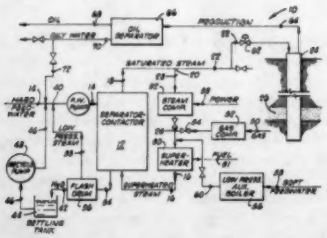
c. after the solvent is in place at the bottom of the petroleum containing formation, applying pressure to the injection wells or production wells or both followed by opening the intermediate wells thus enhancing the flow of the solvent from the bottom of the formation to the top; and

d. shutting the intermediate wells after desired mixing of petroleum and solvent is achieved, and producing the petroleum and solvent from the production wells.

4,398,603
STEAM GENERATION FROM LOW QUALITY FEEDWATER

Leonard G. Rodwell, Calgary, Canada, assignor to Hudson's Bay Oil and Gas Company Limited, Canada

Filed Jan. 7, 1981, Ser. No. 223,172
Int. Cl.[3] E21B *43/24*; F22B *33/18*
U.S. Cl. 166—267 28 Claims



1. A method of producing steam, comprising:

(a) introducing a feedwater stream into a contactor vessel;

(b) introducing superheated steam into said contactor vessel; thereby

(c) contacting said superheated steam with said feedwater; thereby

(d) producing saturated produced steam in said contactor vessel and precipitating minerals from said feedwater in said contactor vessel;

(e) superheating at least a portion of said produced steam in a superheater thereby generating additional superheated steam;

(f) recycling at least a portion of said additional superheated steam to said contactor vessel; and

(g) flowing another portion of said produced steam to a well, and introducing said other portion of said produced steam into said well to steam flood an underground formation intersected by said well.

14. A steam production system, comprising:

contactor vessel means for contacting feedwater and superheated steam to produce saturated produced steam and waste water containing precipitated minerals;

superheater means for superheating produced steam received from said contactor vessel means and thereby generating additional superheated steam;

inlet conduit means for introducing said feedwater into said contactor vessel means;

recycle conduit means for recycling at least a portion of said additional superheated steam to said contactor vessel means;

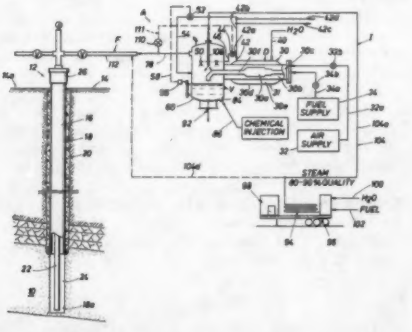
outlet conduit means for withdrawing said saturated produced steam from said contactor vessel means and conducting at least a portion of said saturated produced steam to said superheater means; and

flow conduit means for flowing another portion of said produced steam to a well and thus to an underground formation intersected by said well.

4,398,604
METHOD AND APPARATUS FOR PRODUCING A HIGH PRESSURE THERMAL VAPOR STREAM

Richard W. Krajicek, and John S. Sperry, both of Houston, Tex., assignors to Carmel Energy, Inc., Houston, Tex.

Filed Apr. 13, 1981, Ser. No. 253,320
Int. Cl.[3] E21B *36/00, 43/24, 47/06*
U.S. Cl. 166—303 24 Claims



1. In a method of producing a high pressure thermal vapor stream of water vapor and combustion gases for injection into a subterranean formation for recovering heavy viscous petroleum, the improvement comprising the steps of:

directing high pressure combustion gases into a partially water-filled vapor generator vessel for producing therein a high pressure stream of water vapor and combustion gases;

injecting high quality steam into the high pressure stream of water vapor and combustion gases within the vapor genera-

tor vessel to increase the steam-to-combustion gas ratio of the discharge stream producing within the vapor generator vessel; and

flowing the high pressure discharge stream from the vapor generator vessel into the subterranean formation for enhanced recovery of heavy viscous petroleum from the subterranean formation.

14. An apparatus for producing a high pressure thermal vapor stream of water vapor and combustion gases for recovering heavy viscous petroleum from a subterranean formation, comprising:

a vapor generator vessel, with vapor generator vessel being partially filled with water;

directing means within said vapor generator vessel for directing high pressure combustion gases into said vapor generator vessel for producing a high pressure stream of water vapor and combustion gases in said vapor generator vessel;

injection means within said vapor generator vessel for injecting high quality steam into said high pressure stream of water vapor and combustion gases within said vapor generator vessel to increase the steam-to-combustion gas ratio of a discharge stream produced with said vapor generator vessel; and,

flowing means in connection with said vapor generator vessel for flowing said high pressure discharge stream from said vapor generator vessel into the subterranean formation for enhanced recovery of heavy viscous petroleum from the subterranean formation.

4,398,605

FIRE EXTINGUISHING COMPOSITION AND METHOD

Michael T. Conklin, South New Berlin, and Charles F. Mowry, Rome, both of N.Y., assignors to Fire Out Enterprises Company, Inc., Norwich, N.Y.

Continuation of Ser. No. 129,584, Mar. 12, 1980, abandoned.
This application Sep. 23, 1981, Ser. No. 304,891
Int. Cl.³ A62C *1/00*
U.S. Cl. 169—47 **11 Claims**

1. A method of fire fighting comprising, preparing a concentrate consisting essentially of one or more nonionic, non film forming, surfactants having a combined cloud point of 68° F.–212° F. and sufficient water to form not greater than 30% by weight of a concentrate solution of said surfactant,

mixing said concentrate with water to form a fire fighting solution of said surfactant not greater than 0.2% by volume of said surfactant and

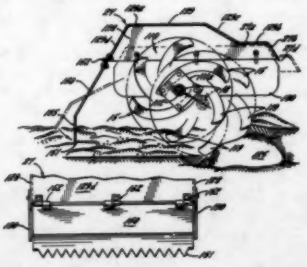
spraying said fire fighting solution on to a fire as at least one water stream without excessive cavitation causing foam.

4,398,606

GARDEN TILLER WITH EXTENDED DRAG SHIELD

Lee R. Herscher, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Mar. 30, 1981, Ser. No. 248,874
Int. Cl.³ A01B *33/02*; B62D *51/04*
U.S. Cl. 172—42 **10 Claims**



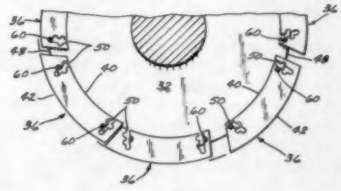
1. A walk behind garden tiller comprising, in combination, a horizontal frame, a handle secured to said frame and projecting rearwardly therefrom for manual guidance of the tiller, an engine mounted on said frame, a tine drive shaft extending transversely to and journaled in a position adjacent said frame, said tine drive shaft having a set of soil penetrating and cutting tines secured thereto, a tine drive train coupled between said engine and said tine drive shaft for rotatably driving said tines, a rigid drag shield pivotably mounted rearwardly of said tiller for smoothing soil after it is tilled and for providing a protective barrier between the operator and a rear exposure to said tines, said drag shield being pivotably mounted at a point on the tiller above the elevation of said tine shaft and having a length greater than the vertical distance between its point of mounting on the tiller and the bottom peripheral level of said tines, said drag shield having a lower ground engaging portion that is formed such that during tilling it is dragged along the top of the soil at a substantial angle to the ground level and during rearward tiller movement said lower ground engaging portion is adapted to anchor in the soil to elevate the rear of the tiller about such anchor to reduce tine contact with the soil, and said lower ground engaging portion having a downwardly directed terminal edge shaped to enhance its ability to anchor into the soil during rearward movement of the tiller and to rake and smooth the tilled soil during forward movement of the tiller.

4,398,607

AUGER WITH ADJUSTABLE WEAR PLATE

Dennis D. Reichardt, Corning, Iowa, assignor to Roscoe Brown Corporation, Lenox, Iowa

Filed Jun. 8, 1981, Ser. No. 271,252
Int. Cl.³ B65G *33/00*; A01B *33/10*; F02F *9/28*
U.S. Cl. 172—119 **1 Claim**



1. An improvement for a backfilling machine having an auger, said auger having a central shaft and a helical flighting thereon, said flighting having an inner radial edge attached to said central shaft and an outer radial edge, said backfilling machine having a frame, wheels, power means for moving said wheels, lift arms attached to said auger for raising and lowering said auger with respect to the ground, and auger power means connected to said auger for rotating same, said improvement comprising:

a plurality of wear plates mounted to said flighting along said outer radial edge thereof;

each of said wear plates having opposite ends, a concave arcuate edge and having a curvature approximately the same as the curvature of said outer radial edge of said flighting;

adjustable securing means attaching said wear plates to said flighting in end to end relation adjacent said outer radial edge of said flighting with said convex edges of said plates protruding radially beyond said outer radial edge of said flighting in approximate concentric orientation therewith;

said adjustable securing means each comprising at least two bolt holes in said flighting, tightenable bolt means extending through each of said bolt holes, at least two slots extending radially with respect to said auger shaft into said plate from said inner arcuate edge toward said outer arcuate edge;

each of said slots being elongated and including opposite side margins and an outer end margin,

said notches being provided along said side margins in spaced apart relation, each of said notches having opposite side edges, one of which faces radially inwardly toward said central auger shaft and one of which faces radially outwardly away from said auger shaft whereby said opposite side edges of said notch engage said bolt means to limit inner and outer radial movement of said plate; and

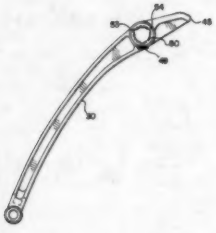
one of said slots in said wear plate being located adjacent one of said opposite ends thereof and the other of said slots being adjacent the other of said opposite ends of said wear plate.

4,398,608

ROTARY HOE

Charles Boetto, Naperville, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed May 18, 1981, Ser. No. 264,363
Int. Cl.³ A01B *39/08*
U.S. Cl. 172—551 **4 Claims**



1. In a rotary hoe that includes an elongated tool bar extending generally transversely to the normal direction of travel of the rotary hoe, an elongated pivot shaft supported on the lower, rear corner of the tool bar and extending parallel thereto, a plurality of support arms spaced along the tool bar and pivotally mounted on said pivot shaft, each support arm having a forward portion for engaging said tool bar and a rearward portion, a hoe wheel rotatably mounted on each arm rearward portion, and spring means extending between each arm and said tool bar to bias the hoe wheel downwardly with each arm forward portion providing a stop with said tool bar to dispose said hoe wheels in an operative position, wherein the improvement comprises: each arm having a hub pivotally mounted on said pivot shaft, said hub having at least one elongated groove extending parallel to and adjacent said shaft, said groove extending the length of said hub on said shaft, and lower drain means establishing soil removing communication from said groove exteriorly of said hub.

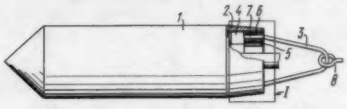
4,398,609

APPARATUS FOR SINKING WELLS IN THE GROUND

Andron T. Karavaev; Vladimir D. Plavskikh; Alexei D. Terskov; Anatoly V. Sukhushin; Nikolai P. Chepurnoi, and Evgeny N. Cherednikov, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.

Filed Mar. 12, 1982, Ser. No. 357,580
Int. Cl.³ E21B *7/26*
U.S. Cl. 175—19 **4 Claims**

1. An apparatus for sinking wells in the ground incorporating a percussion unit with a tail piece, a ring fitted into said tail piece with a clearance and coaxially therewith, a resilient member contained in the clearance between said ring and said tail piece, a means of extracting connected to said tail piece by a rope, passages provided in said resilient member for the ends of said rope to be reeved therethrough stops provided on the inside surface of said tail piece, passages provided in the body



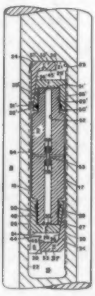
of said stops for the ends of said rope to be reeved therethrough.

4,398,610

ROLLER REAMER APPARATUS

Grey Bassinger, One Allen Center, Suite 1000, Houston, Tex. 77002

Continuation of Ser. No. 156,926, Jun. 6, 1980, abandoned, which is a division of Ser. No. 903,841, May 8, 1978, Pat. No. 4,227,586. This application Apr. 2, 1981, Ser. No. 250,213
Int. Cl.³ E21B *10/26*
U.S. Cl. 175—228 **2 Claims**



1. A self lubricating roller reamer assembly mounted on a reamer body comprising a roller cutter having a bearing journal integral therewith on each end thereof;

a bearing block mounted on said reamer body at either end of said roller cutter, each of said bearing blocks having a bearing journal matingly receiving a roller cutter having a bearing journal integral therewith on each end thereof;

sealing means mounted in said bearing journals to seal against drilling fluids;

a lubricating fluid passageway in said roller reamer assembly communicating with said bearing journals behind said seal rings to deliver lubricating fluid to the bearing journals;

said fluid passageway including a longitudinal bore through said roller cutter, said longitudinal bore being packed with lubricating fluid and having a reduced cross section intermediate the ends thereof with a sliding pistion seal mounted in said bore on either side of the reduced section and a fluid passageway communicating drilling fluid from the well bore to the reduced cross section of the longitudinal bore to apply pressure to the piston seal and thereby force lubricating fluid to the bearing journals.

4,398,611

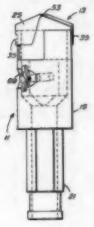
MINING DRILL

Vinod K. Sarin, Lexington, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 8, 1982, Ser. No. 346,972
Int. Cl.³ E21B *10/02*
U.S. Cl. 175—413 **4 Claims**

1. A mine drill for aiding the collection of detritus during drilling comprising a drive body being cylindrically shaped

about an axis of rotation and having an axial passage for the flow detritus, a bit mounted at the forward end of said drive body for movement about said axis of rotation, said bit comprising a body portion including a pair of support lands projecting therefrom in the axial direction and an elongated insert having forwardly projecting cutting edges and a base surface secured to said body portion, said base surface lying in a plane substantially normal to the axis of rotation, each support land being offset said axis of rotation and secured to respective opposite sides of said insert whereby during rotation of said bit leading insert surfaces are mounted to respective support



lands, said insert having end portions extending in a radial direction outwardly of said body portion and said drive body, said drive body having a pair of forwardly projecting flanges forming diametrically opposed apertures, each aperture receiving a respective end portion, each flange extending forwardly of said plane and spaced from respective opposite sides of said insert, a pair of passages adapted for the conveyance of detritus during drilling to said axial passage, each passage being formed in proximity to a respective cutting edge by a respective leading insert surface and a respective flange extending forwardly of said plane.

4,398,612

AUTOMATIC WEIGHING APPARATUS

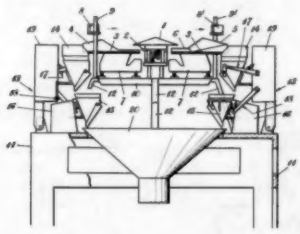
Yoshiharu Mikami; Takashi Sashiki, and Yoshiharu Asai, Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Mar. 19, 1981, Ser. No. 245,351

Claims priority, application Japan, Mar. 25, 1980, 55-40018[U]; Sep. 22, 1980, 55-131924[U]

Int. Cl.³ G01G *19/04, 21/28*

U.S. Cl. 177—25 **15 Claims**



1. An automatic combination weighing apparatus comprising:

a conical dispersion table;

means for driving said dispersion table to cause articles fed on said dispersion table to move outwardly and circumferentially thereon;

a plurality of feed troughs radially arranged around said dispersion table to receive articles from said dispersion table;

a plurality of vibrator means for individually driving said feed troughs in an inclined linear reciprocating vibrating motion thereby advancing articles thereon toward the front end thereof;

a plurality of weighing means positioned under the front ends of said feed troughs and associated therewith, each weighing means including at least a weighing hopper and a weighing mechanism;

control circuit means coupled to said weighing means for calculating combinations of weights on the basis of values of weight of articles measured by said weighing means, wherein the sum weight of the combination of articles is equal to or closest within a preset range of allowance to a predetermined weight value, and for discharging articles in the weighing hoppers of the weighing means corresponding to the predetermined weight value; and

a chute for collecting articles discharged from said weighing hoppers and for dumping the articles outside the apparatus.

4,398,613

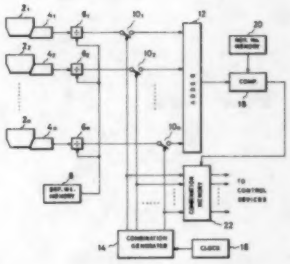
DEVICE FOR GROUPING ARTICLES BY COMBINATION SELECTION SO AS TO HAVE THE PREDETERMINED NUMBER

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Jun. 22, 1981, Ser. No. 275,991

Int. Cl.³ G01G *19/22*

U.S. Cl. 177—25 **3 Claims**



1. A device for grouping articles by combination selection so as to have a predetermined number, comprising a plurality of vessels each containing a plurality of articles, means for determining the number of said articles in each of said vessels and producing electric signals indicative of said number of articles in each vessel, means for selectively extracting the electric signals successively in accordance with a predetermined set of combinations, adder and comparator means for summing the extracted combinations of signals sequentially and producing an output when the number indicated by each of the sums falls within a predetermined range, and memory means responsive to the output of said adder and comparator means for storing the combination at that time.

4,398,614

COMBINATORIAL WEIGHING SYSTEM WITH DISCHARGE CONTROL

Yukio Kakita, and Yoshiharu Mikami, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Dec. 17, 1981, Ser. No. 331,789

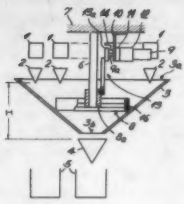
Claims priority, application Japan, Jan. 12, 1981, 56-3354

Int. Cl.³ G01G *19/22, 21/28, 13/16, 13/24*

U.S. Cl. 177—25 **6 Claims**

5. An apparatus for collecting articles in a combinatorial weighing system, comprising a collecting chute for receiving articles from a plurality of weighing hoppers, a timing hopper

located below the discharge port of said collecting chute, and a shutter located, within the collecting chute, above the discharge port of said collecting chute and a drive unit for opening and closing said shutter.



4,398,615

AIR CUSHION VEHICLES

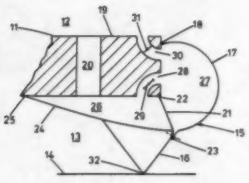
Kay Rollins; Anthony N. Key, both of Ryde, and Thomas F. Arlotte, Newport, all of England, assignors to British Hovercraft Corp. Ltd., Yeovil, England

Filed Jul. 14, 1981, Ser. No. 283,142

Claims priority, application United Kingdom, Jul. 14, 1980, 8022984

Int. Cl.³ B60V *1/16*

U.S. Cl. 180—127 **6 Claims**



1. An A.C.V. having cushion sealing means at least partly constituted by an inflatable skirt structure comprising an inflatable bag member constructed from flexible impermeable sheet material attached to rigid body structure of the A.C.V. along attachment lines that are spaced apart and one of which is situated outboard of the other so as to enclose with said rigid body structure a space, a flexible impermeable web member having a first edge attached to the rigid body structure and a second opposed edge attached to the bag member along respective attachment lines on the rigid body structure and the bag member that are spaced between and substantially parallel with the attachment lines of the bag member to the rigid body structure and whereby said space enclosed by said bag member and said rigid body structure is divided into inboard and outboard compartments with the volume of said outboard compartment being disposed substantially outboard of the rigid body structure of the A.C.V. when the bag member is inflated, first duct means communicating between a source of pressurized air on said A.C.V. and said inboard compartment, second duct means communicating between said inboard and outboard compartments, third duct means communicating said outboard compartment to ambient, first valve means co-operating with said second duct means and adapted for closing said second duct means, and second valve means co-operating with said third duct means and adapted to control venting of said outboard compartment to ambient, said first and second valve means being controllable to vary the inflation pressure of said outboard compartment and thereby to effect changes in the geometry of the flexible skirt structure.

4,398,616

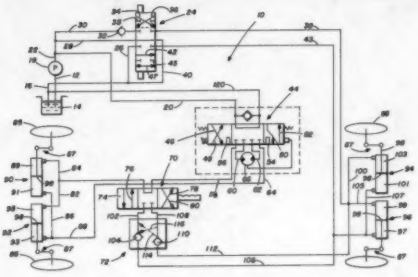
STEERING SYSTEM INCLUDING INDEPENDENTLY OPERATED REAR WHEEL STEERING MEANS FOR A VEHICLE

Donald G. Braden, Galion, and David C. Riehl, Shelby, both of Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 22, 1981, Ser. No. 276,106

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—140 **2 Claims**



1. A system for steering a construction vehicle having a pair of front wheels and a pair of rear wheels comprising:

a hydraulic fluid circuit for distributing hydraulic fluid;

hydraulic cylinder means connected to each wheel for steering the connected wheel;

steering means interposed in the hydraulic fluid circuit for selectively directing hydraulic fluid to said cylinder means for steering said wheels in a desired direction;

mode selector means interposed in the fluid flow circuit between said steering means and said cylinder means for selectively selecting either four-wheel steer, crab steer, or front-wheel steer mode of steering for said vehicle; and

override means for isolating said rear hydraulic cylinder means from said front cylinder means including flow control means for independently supplying fluid to said rear cylinder means for independently steering the rear wheels of the vehicle, said flow control means including rear steer valve means for selectively selecting rear steer mode of operation; and a dual pilot check valve interposed in the hydraulic fluid flow circuit between said mode selector means and said rear hydraulic cylinder means and operable when said rear steer valve means is positioned for selecting rear steer mode of operation to isolate said rear steer cylinder means from said mode selector means and said steering means.

4,398,617

REAR AXLE-DRAWBAR OSCILLATION SUPPORT SYSTEM

Elmer R. Crabb, Montgomery, and Nick D. Hoyle, Lisle, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 18, 1981, Ser. No. 334,024

Int. Cl.³ B62D *53/02*; B60D *1/14*; B60G *25/00*

U.S. Cl. 180—235 **7 Claims**

1. A vehicle (**10**) comprising:

a front frame (**12**);

a rear frame (**14**) being articulatable relative to said front frame (**12**) and having a longitudinal axis (AA), said rear frame (**14**) including a forward end (**14*a***) adjacent said front frame (**12**) and a rearward end (**14*b***) remote thereto;

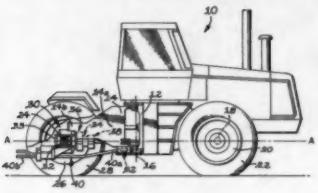
a rear axle assembly (**30**) including an axle housing (**32**) disposed adjacent said rear frame's rearward end and

a support structure (**34**) extending toward said front frame (**12**) and being connected to said axle housing (**32**), and having a longitudinal center line (AA);

a first (**36**) and a second (**38**) bearing disposed between said

support structure (34) and said rear frame (14) forwardly of said axle housing (32) for oscillatably connecting said rear axle assembly (30) to said rear frame (14);

a drawbar (40) for pulling loads, said drawbar (40) extending below said axle housing (32) and said rear frame (14);



means (86,88,90,112) for oscillatably guiding said drawbar (40) with said rear axle assembly (30); and

means (52) for oscillatably connecting said drawbar (40) to said rear frame (14) about said longitudinal centerline (AA).

4,398,618

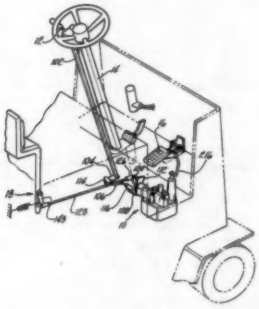
CONTROLLER FOR ELECTRIC TRACTION MOTOR

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 27, 1981, Ser. No. 238,862

Int. Cl.³ B60L *3/02*

U.S. Cl. 180—273 **13 Claims**



1. A controller for use in a vehicle having a traction motor with forward and reverse drive means, said controller comprising,

an actuator member supported for rotational and translational movements,

said actuator member being movable to neutral, forward or reverse positions in one of said movements,

biasing means for urging said actuator member toward the neutral position,

control means adapted to be selectively actuated by said actuator member for selecting forward or reverse drive when the actuator member is in said forward or reverse position,

means for holding said actuator member in said forward or reverse position,

and means responsive to the other of said movements for releasing said holding means whereby the actuator member is moved to said neutral position by said bias means.

4,398,619

LOUDSPEAKER CABINET

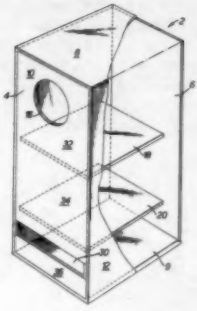
Ronald L. S. Daniel, Whistlers Wood Farm, Southview Rd., Woldingham, Surrey, England

Filed Mar. 31, 1982, Ser. No. 363,662

Claims priority, application United Kingdom, Apr. 2, 1981, 8110400

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—156 **8 Claims**



1. A loudspeaker cabinet comprising front, back, top, bottom and side panels, a speaker drive unit positioned on an upper portion of the front panel, first and second spaced apart sound wave reflector panels positioned below the speaker unit and extending from the front panel towards the rear panel but not engaging the rear panel, a first sound wave pressure relief area defined by the rear panel and the end of the first reflector panel adjacent the rear panel, a second sound wave pressure relief area defined by the rear panel and the end of the second reflector panel adjacent the rear panel, and a third sound wave pressure relief area constituted by a relief aperture which is positioned below the second reflector panel and in the front panel, the loudspeaker cabinet being such that the first and the second reflector panels divide the interior of the loudspeaker cabinet into first, second and third compartments with the speaker drive unit being positioned in the first compartment whereby sound waves from the speaker drive unit are reflected between the first reflector panel and the top panel before passing through the first relief area, and whereby the sound waves are then reflected between the first and the second reflector panels before passing through the second relief area, and whereby the sound waves are then reflected between the second reflector panel and the bottom panel before passing through the third relief area.

4,398,620

APPARATUS FOR SUPPORTING A WORKING PLATFORM ON A PITCHED ROOF

Clyde D. Townsend, 61 Bortz St., Ashville, Ohio 43103

Filed Mar. 19, 1981, Ser. No. 245,543

Int. Cl.³ E04G *3/12, 3/10, 1/24*

U.S. Cl. 182—45 **6 Claims**

1. Apparatus for supporting a working platform on a pitched roof, comprising:

means for engaging said roof adjacent the roof cap thereof;

a support unit moveable up and down the incline of said roof;

suspension means for interconnecting said engaging means and said support unit;

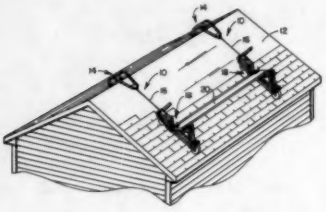
said engaging means having means for fixing one end of said suspension means thereto;

said support unit comprising a base member and trolley means for allowing said support unit to roll across said roof, said base member having a chassis section which, when said trolley means contacts said roof, lies parallel to

and adjacent said roof, said trolley means permitting said chassis section to approach closer to said roof as the load on said support unit increases so that when the load on the support unit exceeds a predetermined value, said chassis section will contact said roof;

said support unit further comprising lockable winch means mounted on said base member for retaining the other end of said suspension means and for varying the length of said suspension means between said support unit and said engaging means, and a platform supporting member pivotally mounted on said base member and lockable relative to said base member at a plurality of differing inclinations relative thereto, said platform supporting member being capable of retaining a working platform thereon;

said platform supporting member being provided with a substantially U-shaped channel section extending transversely thereon and an L-shaped section spaced from and facing but extending substantially parallel to said U-shaped section, thereby enabling a working platform to be retained therebetween,



said trolley means comprises a pair of wheels adjacent opposed ends of said base member, low-pressure pneumatic tires of equal diameter being mounted on said wheels, said tires having internal pressures not exceeding about 12 psig., each wheel being mounted on an axle and a line drawn between said axles being parallel to said chassis section,

the spacing between said chassis section and said roof does not exceed 1¼ inches when no load is imposed on said support unit and said trolley means permits said chassis section to touch said roof when said load on said support unit exceeds about 750 lbs.

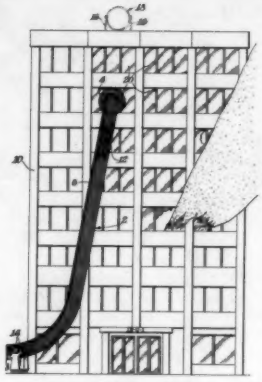
4,398,621

FIRE ESCAPE

Ralph T. Baker, 215 Park Ave., Llangollen, New Castle, Del. 19720

Filed May 6, 1981, Ser. No. 261,010
Int. Cl.³ A62B *1/20*
U.S. Cl. 182—48 **9 Claims**

1. A fire escape comprising an upper supporting entry member and a mesh tube attached at its upper end to said upper supporting entry member, said mesh tube being substantially longer than the building height from which escape is necessary, and a lower, exit-opening support member attached to the lower end of said mesh tube, wherein the openings in said mesh tube have a maximum dimension of about two inches, said tube having inside diameter sufficiently large so as not to restrict passage of a person escaping therethrough, whereby said escaping person can control his rate of descent manually by grasping the mesh anywhere within said tube.

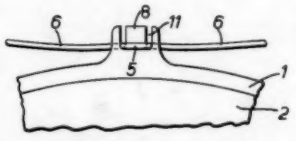


4,398,622

DISC BRAKE PAD ASSEMBLIES

Heinz W. Baum, Saarbrucken Dudweiler, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 71,497, Aug. 31, 1979, Pat. No. 4,290,508
This application Jun. 29, 1981, Ser. No. 278,470
Claims priority, application United Kingdom, Sep. 14, 1978, 36802; Nov. 27, 1978, 46110
Int. Cl.³ F16D *65/40*
U.S. Cl. 188—73.38 **4 Claims**



1. A friction pad assembly comprising: a backing plate having front and rear faces, a top edge, and two lateral edges: projection means extending upwardly from the top edge of the backing plate, the projection means including a pair of laterally spaced apart recesses defining therebetween a central abutment portion of the projection means and defining laterally outwardly of the recesses a pair of side abutment portions of the projection means; friction material secured to the front face of the backing plate; and an anti-rattle spring secured to the projection means by means of a bent region of the spring which passes through said recesses and forms an inter-lock fit with said abutment portions, said bent region of the spring including a central portion located between the recesses and extending throughout its length directly from recess to recess against the projection means in engagement with the central abutment portion; two transverse portions, a transverse portion extending transversely from each end of the central portion through a respective recess; and two end portions, one end portion extending from each transverse portion in a laterally outward direction towards a respective one of said lateral edges and terminating in a free end laterally spaced from said projection means, said end portions being in engagement with the side abutment portions of the projection means, said inter-lock fit being provided solely by the inter-weaving of said spring and said side and central abutment portions.

4,398,623

INTERNAL SHOE DRUM BRAKE ADJUSTING DEVICE

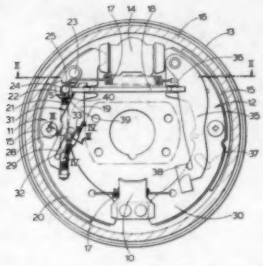
Duncan W. Osborne, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Sep. 16, 1981, Ser. No. 302,544

Claims priority, application United Kingdom, Sep. 19, 1980, 8030387

Int. Cl.³ F16D *65/52*

U.S. Cl. 188—79.5 GE 6 Claims



1. An internal shoe drum brake having an automatic adjuster and comprising;

two brake shoes;

a strut extending from one of said brake shoes towards the other of said brake shoes;

an abutment means pivoted to said other brake shoe and having a free end thereof capable of limited movement relative to said other brake shoe;

a stop means on said other brake shoe and which has a lost-motion connection with the free end of the abutment means so as to limit the movement of the free end;

a wedge mounted on said other brake shoe and located between the free end of the abutment means and the strut;

a spring biasing the wedge to increase the spacing between the free end of the abutment means and the strut;

and a second spring loading the free end of the abutment means against the wedge.

4,398,624

OVERHEAD ELECTRIC TRACTION SYSTEMS

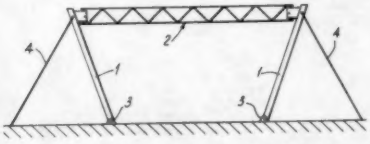
Alan E. Seddon, Rainford, England, assignor to BICC Public Limited Company, London, England

Filed Jan. 23, 1981, Ser. No. 227,716

Claims priority, application United Kingdom, Jan. 28, 1980, 8002752

Int. Cl.³ B60M *1/22*

U.S. Cl. 191—40 17 Claims



1. An overhead electric traction system of the kind in which current is collected from an overhead contact wire by means of a collector carried on the roof of a vehicle and extending transversely of the contact wire, which collector, in its operative position, is pressed upwards into contact with the underside of the contact wire and in which, at at least one of a plurality of positions spaced along the route of the system, the contact wire is supported by an overhead structure comprising two transversely spaced upstanding members, and extending between and connected to said upstanding members, a transversely extending beam, wherein each of the upstanding members is so installed near its lowermost end as to permit limited pivotal movement of the member at least about an axis extending lengthwise of the route of the system; each end of the transversely extending beam is so connected to one of the upstanding members near the uppermost end of the member and limited relative movement is permitted between the beam and the upstanding member at least about an axis extending lengthwise of the route of the system; and each upstanding member is anchored to the ground by at least one tie connected to the member near its uppermost end.

4,398,625

TORSION DAMPING DEVICE FOR A MOTOR VEHICLE CLUTCH

Carlo Beccaris, Santena, Italy, assignor to VALEO Societe Anonyme, Paris, France

Filed Jun. 24, 1980, Ser. No. 162,637

Claims priority, application France, Jun. 25, 1979, 79 16230

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.2 10 Claims

1. A torsion damping device for a motor vehicle clutch, said torsion damping device comprising two coaxial parts mounted for limited relative angular movement within a predetermined sector, a plurality of circumferentially spaced elastic means interposed circumferentially between said coaxial parts, at least one friction washer interposed axially between said coaxial parts, an axially-acting elastic clamping means for exerting an axial force against said friction washer, said elastic clamping means comprising a plurality of elastically deformable lugs projecting radially between circumferentially adjacent ones of said plurality of elastic means, each of said lugs having a radially inner end section separated from a radially outer base section by a chordal bend, said radially inner end section and said radially outer base section defining a dihedral angle with each other, said radially inner end section being cooperable to exert the axial force against said friction washer.

4,398,626

LOW FREQUENCY PHASE SHIFT COIN EXAMINATION METHOD AND APPARATUS

Elwood E. Barnes, Parkesburg, Pa., assignor to Mars, Inc., McLean, Va.

Filed Aug. 21, 1981, Ser. No. 295,138

Int. Cl.³ G07F *3/02*

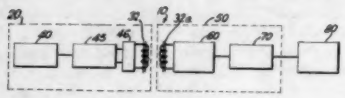
U.S. Cl. 194—100 A 16 Claims

1. A method for examining coins comprising the steps of generating a low frequency electrical signal,

subjecting a coin to an electromagnetic field produced by a first inductor driven by the low frequency signal,

receiving a portion of the field with a second inductor when the coin is between the first and second inductors,

amplifying the electrical output of the second inductor which is produced by the field, and



measuring the phase shift between the low frequency signal which drives the first inductor and the amplified output of the second inductor,

wherein an additional phase shift inversely related to the amplitude of the output of the second inductor is introduced in the amplifying step.

4,398,627

HIGH PRODUCTIVITY DEVICE FOR FEEDING CYLINDRICAL OBJECTS TO SILK-SCREEN PRINTING MACHINES

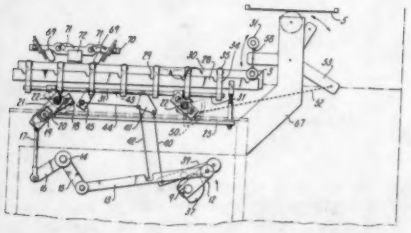
Remigio Saccani, Reggio Emilia, Italy, assignor to Officina Macchine Per Stampa Su Oggetti O.M.S.O. S.p.A., Reggio Emilia, Italy

Filed Oct. 6, 1981, Ser. No. 309,080

Claims priority, application Italy, Nov. 14, 1980, 46904A/80

Int. Cl.³ B65G *47/00*

U.S. Cl. 198—339 **3 Claims**



1. A high speed device for feeding cylindrical objects to silk screen printing machines comprising two parallel bars having a plurality of aligned equidistantly spaced notches for supporting said objects therebetween, gripping means for simultaneously gripping a plurality of the objects and moving the objects from a first pair of notches forwardly toward an adjacent pair of notches,

means for reciprocating the two bars in phase opposition to the gripping means so that the bars move rearwardly as the gripping means move forwardly with the objects, and the bars move forwardly as the gripping means move rearwardly,

means for releasing said gripping means to release said objects prior to rearward motion of said gripping means,

unloading means for unloading the objects from downstream notches of the bars and for feeding the objects, first to the printing machine, and then to a further conveyor, in timed relation to forward movements of said bars,

said unloading means comprising double suction gripping means and additional gripping means for receiving said objects from the double suction gripping means, and means for moving said suction gripping means and said additional gripping means in timed relation to each other.

4,398,628

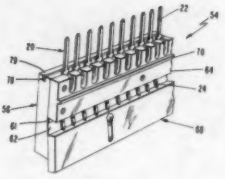
METHODS OF INSERTING PINS INTO AN APPARATUS AND A PIN SUPPORTING SHUTTLE USED THEREFOR

William M. Chisholm, Midlothian, Va., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 192,271, Sep. 30, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 326,103

Int. Cl.³ B65G *47/00*

U.S. Cl. 198—339 **29 Claims**



1. A pin supporting shuttle for supporting pins in a predetermined uniform spacing where each pin has a shank portion with a tip, which comprises:

means for enclosing an intermediate section of each of the pins while maintaining the uniform spacing therebetween;

means for locating the tip of each of the shank portions laterally of the normal axis of the pin to wedge the shank portion between the enclosing means and the locating means; and

means for returning the tip of each of the pins to alignment with the normal axis of the pin to permit separation of the pins from the shuttle.

24. A method of inserting pins, where each pin has a shank portion with a tip, into an apparatus, which comprises the steps of:

enclosing an intermediate section of the shank portion of each of the pins within a pin supporting shuttle;

locating the tip of each of the shank portions laterally of the normal axis of the pin to wedge the shank portion within the pin supporting shuttle;

moving the shuttle to insert opposite ends of the pins into gripping portions of the apparatus; and

returning the tip of each of the pins to alignment with the normal axis of the pin to permit separation of the pins from the shuttle.

4,398,629

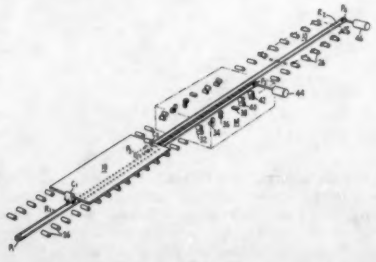
PLATE LATCH AND GUIDE SYSTEM

Calvin C. Williamson, Napa, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Continuation of Ser. No. 198,766, Oct. 20, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,260

Int. Cl.³ B65G *37/00, 49/00*

U.S. Cl. 198—479 **11 Claims**



1. Apparatus for clamping and guiding a section of metal plate to restain lateral movement thereof as it travels longitudi-

nally through a machine wherein said plate is subjected to mechanical work and to forces inducing lateral movement of the plate comprising,

conveyor means for longitudinally moving the plates,

first clamp means adapted to engage the trailing edge of said plate while moving on said conveyor means,

second clamp means adapted to engage the leading edge of said plate while moving on said conveyor means,

guide means for positioning said first and second clamps and extending along the length of said apparatus wherein said lateral forces are effective,

first cable means to which said first clamp means are attached,

second cable means to which second clamp means are attached,

a first pulley system for actuating said first cable means whereby said first clamp means and said first cable means travel forward to engage the trailing edge of said plate travelling toward said machine on said conveyor means to thereby place said first cable means under tension and create a locking force sufficient to lock said first clamp means on said plate,

a second pulley system for actuating said second cable means whereby said second clamp means travels forward after engagement with the leading edge of said plate travelling toward said machine on said conveyor means to thereby place said second cable means under tension and create a locking force sufficient to lock said second clamp means on said plate and enable said first and second cable means and clamp means to travel with said plate through said machine,

said first pulley system and said second pulley system being located adjacent to the longitudinal centerline of said metal plate and in a plane parallel to and spaced from the path of travel of said metal plate to enable said first and second clamp means to engage said edges of said plate at points spaced from the longitudinal edges thereof to thereby leave said longitudinal edges unobstructed for the application of mechanical work thereto,

and means for disengaging said clamp means from said plate edges after said plate has passed through said machine.

4,398,630

WORKPIECE VERTICAL CONVEYOR SYSTEM

John H. Brems, 2800 S. Ocean Blvd., Apt. 16-D, Boca Raton, Fla. 33432

Division of Ser. No. 925,216, Jul. 17, 1978, Pat. No. 4,249,652. This application Dec. 29, 1980, Ser. No. 220,992

Int. Cl.³ B65G *17/32*

U.S. Cl. 198—796 **2 Claims**

1. In an article and pallet carrier system in which articles are transferred to and from pallets, means for loading articles into said pallets, and for unloading articles from said pallets, comprising:

A. an endless conveyor disposed in a generally vertical direction,

B. drive means to move said conveyor,

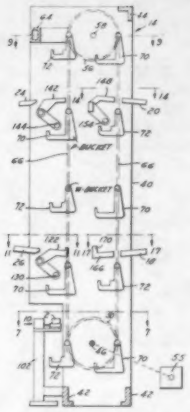
C. one or more first conveying members spaced along said conveyor shaped to receive and carry pallets,

D. one or more second conveying members shaped to receive and carry articles and spaced along said conveyor in a periodic sequence with said first conveying members,

E. means associated with said conveyor for transferring articles from and to said second conveying members in response to movement of the conveyor,

F. means associated with said conveyor for removing and adding said pallets from and to said first conveying members in response to movement of conveyor, and

G. means associated with said conveyor and responsive to its movement for transferring said articles from said article conveying members to said pallets, and for transferring



said articles from said pallets to said article conveying members.

4,398,631

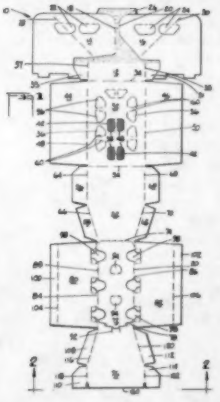
RETURNABLE WRAP-AROUND BEVERAGE CARRIER

Earl J. Graser, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed Dec. 22, 1980, Ser. No. 219,187

Int. Cl.³ B65D *75/04*

U.S. Cl. 206—427 **3 Claims**



1. An improved bottom panel for preventing disfigurement of bottle labels of bottles inserted in a beverage style basket carrier having a pair of side walls and being of the type having a plurality of bottle separator tabs cut and hinged from the bottom panel, wherein the improvement comprises a plurality of the tabs each being hinged from the bottom panel on a separate transverse fold line, each transverse fold line being straight, each transverse fold line being oriented at an angle of approximately 10° off the perpendicular to the side walls of the carrier wih the fold lines of adjacent tabs and the adjacent tabs being angled relative to each other and converging toward each other as the fold lines and the tabs approach the adjacent sidewall to form a generally V-shaped configuration and the

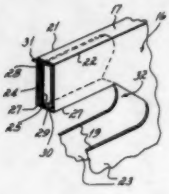
angle of the tab fold lines orienting the tabs to permit bottles to be inserted into the carrier with the bottle striking a flat plane of the tab instead of at a tab edge thereby preventing disfigurement of the bottle label.

4,398,632

HANDLE FOR CARRIER

Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Aug. 7, 1981, Ser. No. 290,945
Int. Cl.³ B65D *75/56, 5/46, 85/62*
U.S. Cl. 206—427 **9 Claims**



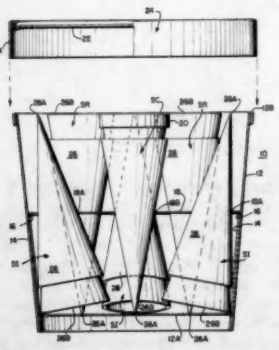
1. In a carrier formed from a blank having a bottom, side walls, and a center partition, the improvement comprising:
first and second flaps partially cut from said upper portion of a carrier blank to form two hand apertures in said blank, each flap having a hinge line and a leading edge,
said first flap hinge line permitting said flap to be folded up upon the upper inner surface of one of said center panels,
a fold line on the second of said flaps and spaced slightly from said hinge line to form a narrow strip,
said second flap being folded up between said center panels with said narrow strip providing a flat contact surface at the upper edge of said hand aperture,
the handle portion of the carrier thus formed providing a generally rectangular cross section box beam above said apertures about which a hand can be wrapped.

4,398,633

PACKAGE FOR ICE CREAM CONES

David Weinstein, Baltimore, Md., assignor to David Weinstein, Owings Mills, Md.

Filed Aug. 11, 1981, Ser. No. 291,951
Int. Cl.³ B65D *85/62, 21/06*
U.S. Cl. 206—499 **12 Claims**



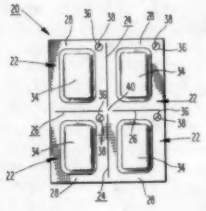
1. Package means for holding a plurality of unfilled ice cream cones comprising:
frustoconical tub means having a closed bottom surface, an open top defined by an annular rim and a frustoconical sidewall;
stand means insertable into said tub means and providing a support about the interior of the sidewall thereof;
keeper means supported by said stand means for positioning said ice cream cones, said keeper means defining a substantially planar array of circular port means therein comprising a center port means and a circular array of outer port means generally concentric with said sidewall;
said center port means and alternate ones of said outer port means receiving at least one unfilled ice cream cone each, with the apices of the said ice cream cones positioned adjacent the said bottom surface of said tub means and the remaining ones of said outer port means receiving at least one inverted unfilled ice cream cone each with the apices thereof adjacent said top rim and to constrain said inverted cones in an outwardly canted posture; and
lid means overlying said annular rim of said tub means.

4,398,634

CHILD-PROOF PACKAGE SYSTEM

Robert B. McClosky, Hope, N.J., assignor to Wrapade Machine Company, Inc., Clifton, N.J.

Filed Nov. 12, 1981, Ser. No. 320,756
Int. Cl.³ B65D *83/04, 85/56*
U.S. Cl. 206—532 **4 Claims**



1. A sealed package system including multiple sealed units separably interconnected to each other, said units including opposed, substantially planar tear-resistant flexible plastic sheets sealed to each other around a peripheral zone to provide a central article-containing compartment therein; seal zones between adjacent compartments including substantially linear tear lines along which the individual units are separable without disrupting the integrity of the sealed compartments thereof, each tear line including a substantially linear, continuous slit uninterrupted by bridge areas and being linearly aligned with compartments in adjacent units interconnected by said tear line, the linear dimension of each of said slits being greater than the greatest linear dimension of the linearly aligned compartments, as measured substantially parallel to said slits, whereby uncut bridge areas are not in linear alignment with adjacent compartments.

4,398,635

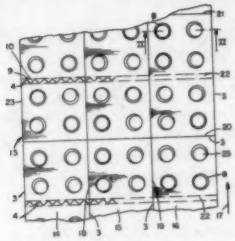
CHILD-PROOF MEDICATION PACKAGE

Edmund Hirt, Stuttgart, Fed. Rep. of Germany, assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 288,359, Jul. 30, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,904
Int. Cl.³ B65D *83/04, 85/42*
U.S. Cl. 206—532 **6 Claims**

1. Child-proof medication/drug package in which the medication/drug is arranged between upper and lower sheets, for each medication/drug a special accommodation chamber is provided between the welded or heat-sealed sheets and is accessible by a tearing in of the package proceeding from the edge, comprising two sheets heat-sealed or welded to one another with such a strength and tenacity that they cannot be

torn in without a tool at either a lateral edge, nor that the medication/drug can be forced through one of the sheets, and at least one edge there are provided notches, which notches comprise said sheets welded together so that the edges of the sheets are co-terminous in the area of the notch, where at least



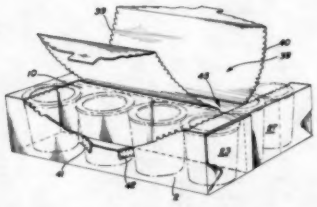
one such notch is assigned to each accommodation chamber and the tearing force to be mustered while making use of the notch is greater than the force than can as a rule be mustered by a child, and less than a force that cannot as a rule be mustered by an adult.

4,398,636

ARTICLE CASE AND BLANK THEREFOR

Ronald A. Baxter, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 13, 1981, Ser. No. 321,218
Int. Cl.³ B65D 5/54
U.S. Cl. 206—614 **12 Claims**



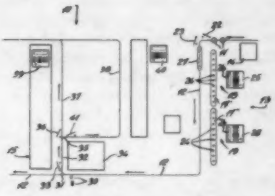
1. An article case comprising a top wall, a pair of side walls foldably joined respectively to the side edges of said top wall and extending downwardly therefrom, a pair of overlapping bottom panels joined respectively to the lower edges of said side walls to form a bottom wall, a pair of end panels foldably joined respectively to the end edges of said top wall and extending downwardly therefrom, a pair of end panels foldably joined respectively to the end edges of said bottom wall and extending upwardly therefrom, a pair of spaced rib panels extending between said top and bottom walls, a connecting panel foldably joined respectively to the upper edges of said rib panels and being disposed in flat face contacting relation with the lower surface of said top wall, a tear strip formed in said connecting panel, a removable portion formed in said top wall, and said tear strip being attached to said removable portion to allow simultaneous removal of said tear strip as said removable portion is separated from said case.

4,398,637

METHOD AND SYSTEM FOR GRADING AND SORTING ARTICLES

Guy Fleury, Quebec, Canada, assignor to Dicta-Son Inc., Quebec, Canada

Filed Dec. 19, 1980, Ser. No. 218,209
Int. Cl.³ B07C 3/20, 5/24
U.S. Cl. 209—546 **12 Claims**



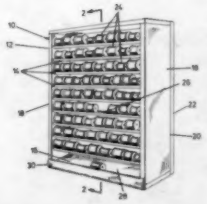
1. An identification system for grading and sorting articles comprising a conveyor line for sequentially conveying a plurality of articles, a coding station for identifying a first one of said plurality of articles with an electronically stored information code indicative of specific characteristics of said first article, and sequentially operable indicator means to visually identify the location of said first article moving along a predetermined portion of said conveyor line at said coding station where said information code is to be stored until said information code is completed and a termination signal to that effect is generated whereby a following article is visually indicated by said indicator means as being a first article in said predetermined portion of said conveyor line and identified with its information code, said indicator means being a plurality of light sources positioned along said predetermined portion of said conveyor line, said light sources being illuminated momentarily in sequence and in alignment with said first one of said articles moving along said conveyor line, said light sources being illuminated for a time duration dependent on the displacement time of said first article along said predetermined portion of said conveyor line.

4,398,638

RACK FOR HOLDING SPOOLS

David E. Racine, 4822 Marathon Cir., Madison, Wis. 53705

Filed Nov. 12, 1981, Ser. No. 320,446
Int. Cl.³ A47F 7/00
U.S. Cl. 211—60 R **11 Claims**



1. A rack **(10)** for holding spools **(24)** comprising:

(a) a frame **(12)** having a rear surface **(20)**;

(b) a plurality of substantially horizontal, vertically arrayed shelf means **(14)** for supporting a plurality of spools **(24)** in stable, end-to-end relation, each shelf means **(14)** supported by the frame **(12)** and located forwardly at a selected distance from the rear surface **(20)**, the space extending from the rear surface **(20)** forwardly to the most rearwardly projecting part of the shelf means **(14)** and spools **(24)** held thereon forming a spool passage **(27)** that extends upwardly behind all the shelf means **(14)**, the spool passage **(27)** being

sufficiently deep at any given level to allow any spool (24) stored at and above that level to freely fall downwardly through the spool passage (27), the clearance above each shelf means (14) being at least as great as the diameter of the largest spool (24) to be supported thereby; and

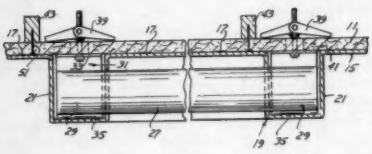
(c) a collection tray (16) supported by the frame (12) extending forwardly from the rear surface (20) underneath the shelf means (14) for a selected distance, the clearance between the collection tray (16) and the lowermost shelf means (14) being at least as great as the diameter of the largest spool (24) to be held in the rack (10), so that a spool (24) supported by a shelf means (14) may be thrust backwardly off the shelf means (14) to fall through the spool passage (27) and come to rest on the collection tray (16), whereon the spool (24) may be grasped at the sides thereof and removed from the rack (10).

4,398,639

SAFETY TOWEL BAR FOR WALL PANELS

Phillip D. Daniels, Bloomfield, Mich., assignor to Novi Plastics Company, Novi, Mich.

Filed Aug. 21, 1981, Ser. No. 294,910
Int. Cl.³ A47K *10/00*
U.S. Cl. 211—105.1 **11 Claims**



1. A safety towel bar for a plastic wall surround panel for showers and tubs comprising a building framework having a dry wall secured thereto;

a pair of laterally spaced support brackets secured to and projecting forwardly of said dry wall;

a substantially flat plastic wall panel overlying and adhesively secured to said dry wall;

said panel having a pair of laterally spaced outwardly projecting upright channels integral therewith;

said channels opening rearwardly of said panels;

an elongated horizontal tube forwardly of said panel with its ends projected into said channels;

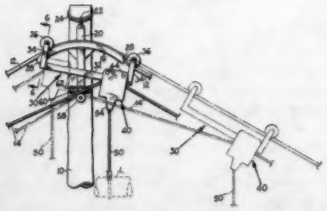
said tube ends within said channels being supportably positioned over, mounted upon and retained by said brackets against outward and downward movement.

4,398,640

MULTI-SPAN SKYLINE LOGGING SYSTEM

Shubert J. Hunter, P.O. Box 273, Estacada, Oreg. 97023

Filed Feb. 27, 1981, Ser. No. 238,690
Int. Cl.³ B63C *19/00*
U.S. Cl. 212—76 **6 Claims**



1. A multi-span skyline logging system of a type using a spar member, said system comprising

(a) an arcuate jack having entrance and exit ends,

(b) support means on said jack arranged to secure it to a spar member,

(c) a skyline extending over said jack in supported relation,

(d) carriage means arranged for movable support along said skyline and over said jack,

(e) drop line means on said carriage for connection to a load of logs,

(f) mainline means connected to said carriage means arranged to pull the latter along the skyline,

(g) guide means arranged to be supported on the spar member over which said mainline is trained for guided movement,

(h) said guide means being disposed adjacent to said jack in an arrangement whereby the pull on said carriage means from said mainline is substantially tangent to the arcuate contour of said jack at its entrance end,

(i) and interengaging clearance means on said spar member and said carriage,

(j) said clearance means including a cam and cam follower,

(k) one of said cam and cam follower being disposed on said spar member below said jack and the other of said cam and cam follower being disposed on said carriage means,

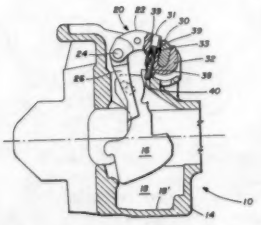
(l) said cam projecting horizontally outwardly and being arranged when engaged by said cam follower as said carriage means moves over said jack to swing said carriage means outwardly at the bottom to allow bypass of said drop line past said guide means.

4,398,641

INVERSION PROTECTION FOR RAILROAD CAR COUPLER

Richard F. Klimowicz, West Seneca, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 7, 1981, Ser. No. 261,334
Int. Cl.³ B61G *3/04*
U.S. Cl. 213—109 **6 Claims**



4. Latching means for maintaining a railway car knuckle coupler locked when the coupler is placed in an inverted position comprising:

a latching member connected to the lever of the rotary lock-lift assembly of said coupler and supported thereon in inoperative position when the coupler is in its normal working position; and

abutment means extending into a chamber defined by the head of the coupler, with said latching member being spaced from said abutment means in the inoperative position and moving into engagement therewith when the coupler is inverted.

4,398,642

MULTI-PLY VESSEL AND METHOD FOR PRODUCTION THEREOF

Tadashi Okudaira; Akio Tsuboi; Shigeharu Sugihara, and Yoshihisa Hama, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

PCT No. PCT/JP80/00269, § 371 Date Jun. 2, 1981, § 102(e) Date Jun. 2, 1981, PCT Pub. No. WO81/01265, PCT Pub. Date May 14, 1981

PCT Filed Oct. 29, 1980, Ser. No. 269,056

Claims priority, application Japan, Nov. 2, 1979, 54-142483; Nov. 2, 1979, 54-142486

Int. Cl.³ B65D *23/00*

U.S. Cl. 215—1 C 6 Claims

1. A biaxially oriented blow-molded transparent multi-ply vessel having dimensional stability and form retention characteristics having a multi-ply structure composed of at least two kinds of synthetic resins which comprises an inner layer composed of a thermoplastic polyester resin having an intrinsic viscosity of 0.55 or more, an intermediate layer composed of metaxylylene group-containing polyamide resin and an outer layer composed of a synthetic resin having impermeability to moisture, said layers of the thermoplastic polyester resin and the metaxylylene group-containing polyamide resin being oriented in at least one direction at the thin part of the vessel wall.

4,398,643

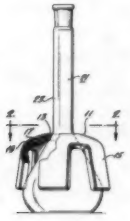
PLIABLE WEIGHT FOR LABORATORY WARE

Daniel R. Conlon, 600 Meetinghouse Rd., Jenkintown, Pa. 19046

Filed Jul. 15, 1981, Ser. No. 283,472

Int. Cl.³ B01L *9/00*

U.S. Cl. 215—100 R 2 Claims



1. A lead disc with a central hole adapted for stabilizing a container such as a volumetric flask or a graduated cylinder, said disc having a plurality of integral symmetrically spaced flexible extensions, said extensions being capable of being bent downwardly and upwardly from the plane of said disc, and said disc being coated with a cushioning material.

4,398,644

TWO-LAYER CLOSURE, PARTICULARLY FOR CLOSING PLASTIC CONTAINERS

Bruno Claude, Montivilliers; Daniel Pellerin, and Jean-Jacques Labaig, both of Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Continuation of Ser. No. 97,186, Nov. 26, 1979, abandoned. This application Oct. 7, 1981, Ser. No. 309,159

Claims priority, application France, Nov. 24, 1978, 78 33243

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—232 10 Claims

1. An article of manufacture comprising a container formed of polyethylene or polypropylene having an opening therein, a metal-foil closure heat-sealed to said container across said opening, said closure comprising a metal foil, an adhesive layer bonded to one side of said foil, said adhesive layer being formed of a mixture of two compounds A and B, compound A being a copolymer of an aliphatic monoolefin and of a monoethylenically unsaturated carboxylic acid capable of having good heat-sealed adhesion to the metal foil and to the container, and compound B being a compound which reduces said adhesion of compound A for the container sufficiently that a viable capping seal was formed by heat sealing and yet closure is conveniently peelable from said container.

4,398,645

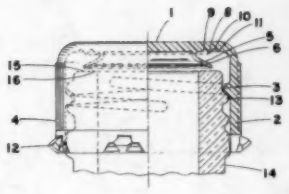
CLOSURE FOR PRESSURIZED CONTAINERS

Thurston Toeppen, Lois La., R.D. 3, Poughkeepsie, N.Y. 12603

Filed Jun. 29, 1981, Ser. No. 278,971

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—252 9 Claims



1. A closure device molded of resilient material, in combination with a container having an external screw thread about an opening and a rim perpendicular to said thread, comprising: a circular crown disc, a cylindrical sidewall or skirt depending from said crown disc and perpendicular to it, an internal screw thread within said sidewall to mate with said external screw thread, and multiple sealing means integral with the inside surface of said crown disc for cooperation with the upper rim and adjacent inside rim of the opening of said container, said multiple sealing means comprising:

a first sealing means in the form of a circular ridge dependent from said crown disc and having a diameter substantially equal to the mean diameter of said upper rim, said ridge having at least one concentric groove immediately adjacent thereto;

a second sealing means in the form of an outwardly flaring frusto-conical flexible flange supported by a concentric attachment to said crown disc and having an outer rim diameter substantially larger than the diameter of said first sealing means, said flange being engageable by said circular ridge to move said flange into intimate contact with a portion of said rim axially opposed to said ridge.

4,398,646

MULTI-LAYERED VESSEL WITH DISCONTINUITY NEUTRALIZING AREA

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

Filed Nov. 16, 1981, Ser. No. 321,477

Int. Cl.³ F17C *1/14;* B23K *31/00*

U.S. Cl. 220—3 8 Claims

1. A multi-layered vessel, comprising:

a multi-layered generally cylindrical shell;

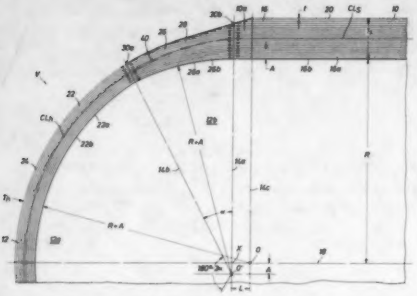
at least one multi-layered generally hemispherical head mounted to an end of said shell;

said shell being thicker than said head;

said head having a main section and a discontinuity neutralizing portion adjacent said end of said shell;

each layer of said head main section and said discontinuity

neutralizing portion having gores with substantially equal radius of curvature in each layer; and



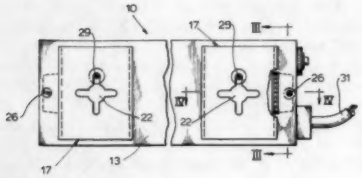
said gores of said discontinuity neutralizing portion having a different center of curvature than the gores of said head main section.

4,398,647

TEMPORARY MOUNTING MEANS FOR MULTIPLE OUTLET STRIP

Norman A. Ackerman, Morton Grove, Ill., assignor to Perma Power Electronics, Inc., Chicago, Ill.

Filed Apr. 28, 1981, Ser. No. 258,426
Int. Cl.³ H05K 5/00; H02G 3/08
U.S. Cl. 220—3.9 **4 Claims**



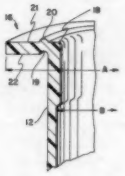
1. An apparatus mounting a housing having a planar rear surface to a wall such that it is impossible to lock said housing to the wall so that the housing cannot be moved comprising, a pair of spaced slots formed in said planar rear surface, a pair of locking holes formed in said planar rear surface adjacent said slots, a first bracket formed with a main planar portion formed with a first mounting slot loosely receiving the head of a first mounting screw or bolt which extends from the wall, a first pair of off-setting legs attached to said main portion to space it from the rear of said planar wall of said housing, a first tab with a first locking opening formed therein extending from one of said first pair of legs parallel to said planar rear surface and in the opposite direction thereto, said first tab received in one of said spaced slots in said planar rear surface, a first locking screw or bolt received into one of said locking holes of said planar rear surface and through the opening of said first tab to lock said first tab to the rear panel of said housing such that said first bracket is not visible from the front of said housing, a second bracket formed with a main planar portion formed with a second mounting slot for loosely receiving the head of a second mounting screw or bolt which extends from the wall, a second pair of off-setting legs attached to said main portion to space it from the rear of said planar wall of said housing, a second tab with a second locking opening formed therein extending from one leg of said second pair of legs parallel to said planar rear surface and in the opposite direction thereto, said second tab received in the other of said spaced slots in said planar rear surface, a second locking screw or bolt received into the other of said locking holes of said planar rear surface and through the opening of said second tab to lock said second tab to the rear panel of said housing so that said second bracket is not visible from the front of said housing.

4,398,648

FLANGE STRUCTURE FOR PLASTIC CONTAINER

Daryl D. Cerny, Greenville, Ohio, and Virgil C. Reynolds, Jr., Yorktown, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 3, 1981, Ser. No. 289,355
Int. Cl.³ B65D 6/38
U.S. Cl. 220—67 **2 Claims**



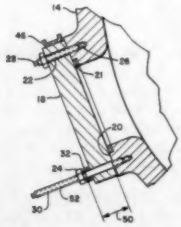
1. A container comprising a sidewall and an integral bottom wall with one end of said container being open, a peripheral flange integral with said sidewall and surrounding said open end, said flange being adapted to interfold with the periphery of a closure to form an interlocking seam therewith to close the open end of the container, said flange having on one surface thereof a first channel situated circumferentially and adjacent said sidewall, said channel having a radius of curvature substantially equal to about the thickness of the periphery of said closure, and said flange having a complementary bead overriding said channel on the other side of said flange.

4,398,649

PRIMARY MANWAY COVER REMOVAL

Thomas V. Labbe, Hixson, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 29, 1981, Ser. No. 316,571
Int. Cl.³ B65D 45/00
U.S. Cl. 220—327 **9 Claims**



2. In combination, a vessel, opening means in the vessel, a plurality of studs securing the cover onto the vessel, the studs having inner ends threaded into openings in the vessel, nuts cooperating with the outer ends of each of the studs, two of the studs which are substantially diametrically opposite each other being overlength, of such a length that when the nuts of the overlength studs are unthreaded a given amount, and the nuts on all of the other studs are removed and the cover moved away from the opening into contact with the nuts on the overlength studs, the inner surface of the cover is outside of the outer ends of all of the other studs, cable means attached to the periphery of the cover, guide means on the periphery of the cover to keep the cable from slipping off the periphery of the cover, and means for causing controlled pivoting about one of

the overlength studs until the cover permits access to the vessel interior, after the other overlength stud and its associated nut has been removed.

4,398,650

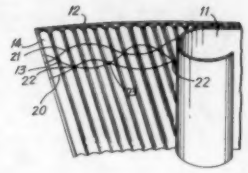
ENERGY ABSORBING CORRUGATED PAPER CONTAINER

Henry C. Holmes, Brooklyn Center, and Roderick D. Johnson, Southeast Minneapolis, both of Minn., assignors to International Paper Company, New York, N.Y.

Filed Dec. 8, 1978, Ser. No. 968,043

Int. Cl.³ B65D *5/56*

U.S. Cl. 220—443 **7 Claims**



1. A reinforced corrugated paper container for containing generally heavy articles comprising:

a bottom wall;

a plurality of side walls in excess of four forming a generally polygonal configuration and defining the periphery of said container; an outer liner for defining the outer liner of said side walls;

an inner liner;

a corrugated medium adhesively secured between said outer liner and said inner liner, said corrugated medium having its flutes extending generally in a vertical direction; and

a family of reinforcing strands between said outer liner and said corrugated medium in adhesive contact with the crests of said flutes of said corrugated medium, in essentially continuous adhesive contact with said outer liner and spaced from the valley between adjacent crests of said flutes along substantially the entire periphery of said container, said reinforcing strands being so positioned as to define a family of generally parallel curvilinear paths extending along said periphery, whereby when said container contains articles sufficiently heavy to cause distortion of said side walls thereof, said container tends to become circularized and said reinforcing strands exert a restraining force having a first vector component normal to the plane of one of said side walls and a second vector component generally parallel to said plane and said reinforcing strands distort said medium resulting in the absorption of energy before said container fails.

4,398,651

MICROWAVE FOOD DISPENSING MACHINE

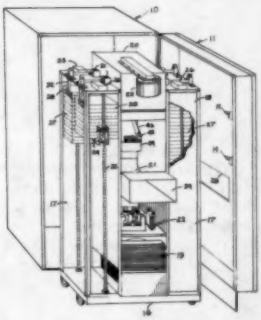
Beverly D. Kumpfer, 4335 Spruce Cir., Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 906,477, Aug. 17, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,921

Int. Cl.³ G07F *5/00*; H05B *6/68*

U.S. Cl. 221—6 **8 Claims**

1. In an unattended automatic food vending system, comprising an outer, microwave-confining cabinet containing a microwave oven having at least one microwave-confining entry door through which packaged food containers may be introduced for heating and an exit door to permit said food containers to be delivered after heating; a delivery chute for said food containers; a delivery opening in said cabinet permitting access to food containers in said delivery chute; one or more low-temperature storage compartments within said cabinet adjacent to said microwave oven for receiving food containers constructed of material which is transparent to microwave energy but which is an effective thermal insulator, and which may contain microwave-shielded compartments; conveying means within said one or more storage compartments and having shelves for supporting said food containers in one or more vertical stacks; means for automatically positioning the uppermost of said food containers in said one or more vertical stacks adjacent to corresponding ones of said entry doors of said microwave oven; propulsion means operative to move any selected uppermost food container through a corresponding one of said entry doors and into said microwave oven; and electrical logic circuitry operative to initiate microwave power generation upon the entry of a selected food container into said oven and to initiate operation of said exit door of the oven after completion of a predetermined heating



interval; the improvement wherein there are provided electronic means for the remote determination of food inventory by electronically counting the number of food containers remaining in or depleted from the container stacks and by transmitting the count to a remote location upon interrogation by a signal from said remote location or as internally generated, said electronic means including magnets affixed to the food container shelves, respectively; and respective magnetic reed switches disposed along the direction of travel of the conveying means, said switches being operative to produce electrical analogue signals proportional to the height of the resepctive food container shelves and hence proportional to the number of said food containers remaining in or removed from the food container stacks.

4,398,652

METHOD AND DISPENSER FOR DISPENSING BEER

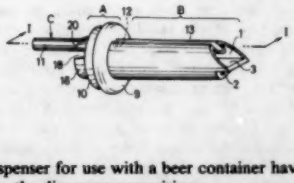
Toshihiro Ueda, Ibaraki; Masamichi Imanishi, and Takayoshi Miyano, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Oct. 21, 1980, Ser. No. 199,240

Claims priority, application Japan, Nov. 21, 1979, 54-151648; Feb. 22, 1980, 55-22913[U]; May 12, 1980, 55-63173; Jul. 9, 1980, 55-94379; Jul. 14, 1980, 55-96741; Jul. 15, 1980, 55-100484[U]; Aug. 6, 1980, 55-112100[U]; Aug. 6, 1980, 55-112101[U]

Int. Cl.³ B65D *25/48*; B67D *3/04*

U.S. Cl. 222—1 **39 Claims**



10. A beer dispenser for use with a beer container having a pouring opening, the dispenser comprising:

a coupling portion (A) including means for easy attachment

to and easy detachment from the opening of the beer container; and

a spout portion (B) coupled to said coupling portion (A) for receiving beer to be poured from said container and forming said beer to be poured into a plurality of streams of beer;

said spout portion (B) having a front end portion, and including a spout-like tube having a main pouring port (1) and a subsidiary pouring port (2) at the front end portion of said spout portion; and

said main and subsidiary pouring ports (1,2) including means for directing streams of beer passing therethrough away from each other.

4,398,653

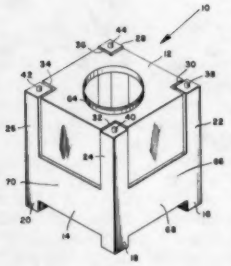
PORTABLE STORAGE AND DISPENSER PLASTIC HOPPER WITH PLASTIC BASE

Pasquale C. Daloisio, New Hope, Pa., assignor to Pennsylvania Pacific Corporation, Warminster, Pa.

Filed Feb. 25, 1982, Ser. No. 352,174

Int. Cl.³ B67D *5/06*

U.S. Cl. 222—185 **3 Claims**



1. An assembly for storing and dispensing flowable materials such as capsules, tablets, pills and other dry products comprising,

a hopper having a generally rectangular upper portion and a generally frustoconical lower portion with external peripheral shoulder means at the interface of said upper and lower portions, said hopper being molded of plastic as a seamless single wall with vertical notch means provided at each of the four corners of said upper portion, and

a base molded of plastic as a seamless double wall having an outer wall that is generally rectangular in shape and an inner wall that is generally frustoconical in shape and matching the frustoconical shape of said lower portion of said hopper, said base outer and inner walls being connected by bottom panel means and top panel means, said base having leg means and upstanding post means integrally molded with said inner and outer walls at each of the four corners of said base.

said hopper fitting within said base with said shoulder means of said hopper resting on said top panel means of said base and said frustoconical lower portion of said hopper resting on said frustoconical inner wall of said base with each of said post means at the corners of said ase fitting within an associated notch at the corners of said hopper.

4,398,654

AEROSOL DISPENSING SYSTEM

Richard G. S. Pong, Passaic Park; Arun Nandagiri, Dover; Oleh M. Bilynskyj, East Hanover, and LeRoy Hunter, Randolph, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 84,687, Oct. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 973,261, Dec. 22, 1978, abandoned. This application Jan. 4, 1980, Ser. No. 136,206

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—402.1 **6 Claims**

1. Valve and diptube means for a pressurized aerosol container, containing two immiscible liquid phases and a vapor phase therein; said valve and diptube means adapted to simultaneously draw off both liquid phases to said valve means; said diptube means being attached to said valve means at its upper end and having the lower end extending to a point near the bottom of said container, said diptube means comprising a first diptube permeable substantially only to the upper of said liquid phases and connected to an orifice in said valve means and closed at its lower end; and a second diptube connected to a second orifice in said valve which is open at its lower end and substantially impermeable to said liquid and vapor phases.

2. Valve and diptube means for a pressurized aerosol container, containing two immiscible liquid phases and a vapor phase therein; said valve and diptube means adapted to simultaneously draw off both liquid phases to said valve menas; said diptube means being attached to said valve means at its upper end and having the lower end extending to a point near the bottom of said container, said diptube means comprising, a first impermeable diptube connected to an opening to said valve means and being open at its lower end and a second diptube comprising a sleeve permeable substantially only to the upper of said liquid phases surrounding said impermeable diptube and being closed at its lower end, said sleeve being connected to said valve means, and having an opening from the area within said permeable diptube sleeve to said valve means.

3. Valve and diptube means for a pressurized aerosol container, containing a hydroalcoholic liquid phase, a liquified hydrocarbon propellant phase and a vapor hydrocarbon phase therein; said valve and diptube means adapted to simultaneously draw off both liquid phases to said valve means; said diptube means being attached to said valve means at its upper end and having the lower end extending to a point near the bottom of said container, said diptube means comprising a single tube connected to an orifice in said valve means and open at its lower end, said diptube being permeable substantially only to said liquified propellant.

4,398,655

BELT HOLSTER COMBINATION

Wilbert O. Perry, Bunnlevel, N.C., assignor to Bangor Punta Corporation, Greenwich, Conn.

Filed Sep. 27, 1982, Ser. No. 424,723

Int. Cl.³ F41C *33/02*

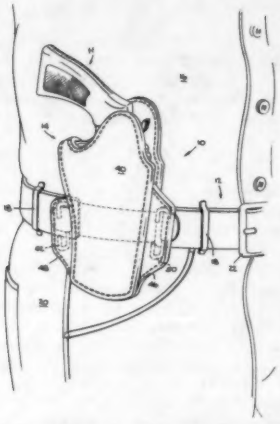
U.S. Cl. 224—191 **8 Claims**

1. Apparatus for carrying a handgun comprising:

a holster for receiving a handgun and having first and sec-

ond fastening elements spaced laterally one from the other a first predetermined distance, and

a belt for carrying said holster and having an elastic portion and first and second fastening elements carried by said belt adjacent respective opposite end portions of said elastic portion and spaced laterally one from the other a second predetermined distance less than said first predetermined



distance when said elastic portion lies in a relaxed condition,

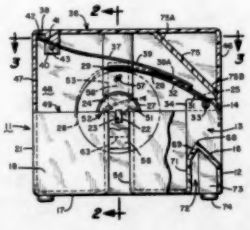
said first and second fastening elements carried by said belt and said first and second fastening elements carried by said holster being connected, respectively, one to the other when the belt is disposed about an individual and tensioned to stretch said elastic portion thereby to secure said holster to said belt.

4,398,656

DISPENSING APPARATUS FOR TISSUE ROLLS

Walter E. McCadden, 3439 Terrace La., Golden Valley, Minn. 55422

Filed Dec. 24, 1981, Ser. No. 334,324
Int. Cl.³ B26D *1/02*
U.S. Cl. 225—47 **17 Claims**



1. Dispensing apparatus for tissue rolls of the type having a cylindrical axial central support opening, said apparatus comprising:

(a) a body member having

(1) axially spaced tissue roll bearing portions, and

(2) a cutting edge parallel to the axis of the bearing portions and spaced forwardly therefrom;

(b) a cylindrical roll support having

(1) axially spaced end shafts for manually removable supporting engagement with said bearing portions, and

(2) a cylindrical body portion adapted to slide coaxially into such a tissue roll support opening;

(c) a lower tissue guide plate having

(1) an outer edge pivotally supported on the body member for swinging movement around an axis parallel to and spaced inwardly close to the cutting edge,

(2) an inner guide edge above and parallel to the roll support, and

(3) an intermediate plate portion extending between the pivotally supported outer edge and said inner guide edge and substantially across the full width of the tissue to be withdrawn tangentially from such a roll mounted on the roll support;

the inner edge of the guide plate being adapted to rest on top of the tissue roll beneath the uppermost layer of tissue and thereby support such layer for movement from the top of the roll and past said cutting edge; and

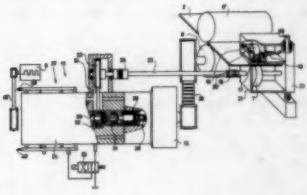
(d) a resiliently flexible upper guide and hold-down member extending in frictional engagement along the upper surface of a tissue layer supported on the lower guide plate between the tissue roll and cutting edge and thereby preventing unintended rewinding and withdrawal of the free end of the outermost tissue layer, after an end portion thereof is severed at the cutting edge.

4,398,657

FEEDING DEVICE, IN PARTICULAR FOR THE CYCLED FEEDING OF ROD OR TAPE LIKE MATERIAL IN PRESSES, CUTTERS, OR THE LIKE

Eckehart Schulze, Weissach-Flacht, and Werner Kuttruf, Wuppertal, both of Fed. Rep. of Germany, assignors to Hartmann & Lämmle GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 236,713
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007492
Int. Cl.³ B65H *17/20, 23/22, 25/20*
U.S. Cl. 226—11 **16 Claims**



1. Feeding device for the cycled feeding of rod or tape-line material into a press, cutter or the like, comprising at least one feeding roller mounted in contact with the material to be fed; a stepping motor for advancing said roller in a feeding path; a controllable hydromotor interconnected between said stepping motor and said feeding roller; a true value indicator including a metering wheel which rolls off at least indirectly on the material being fed; hydraulic control valve means; a true value input metering spindle releasably-connectable to said hydromotor, said true value input metering spindle being mechanically coupled to said metering wheel, said hydraulic control valve means being adapted to control said hydromotor so as to connect or disconnect said metering spindle from said hydromotor; a first coupling adapted to interrupt the mechanical coupling between said true value input metering spindle and said metering wheel; a second coupling, said hydromotor having an output, said second coupling being mounted to said output and operated for selectively connecting to or disconnecting said metering spindle from said hydromotor; an end switch which is controlled by the material being fed, said end switch being adapted to switch on and off said first and said second couplings so that when the material to be fed is missing

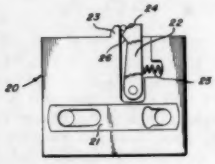
on said feeding roller said metering spindle is coupled to the output of said hydromotor; and rotary magnifier means operatively interconnected between said stepping motor and said metering spindle, said rotary magnifier means including a nut part connected to said stepping motor which drive the latter, and a ball rotary thread means disposed between the metering spindle and said nut part and operative so that said metering spindle is displaceable in the axial direction thereof to control said control valve means which are provided with a plurality of control conduits connectable to said hydromotor.

4,398,658

HIGH SPEED RADIAL LEAD COMPONENT SEQUENCING AND INSERTING MACHINE

Michael D. Snyder; Welbley J. Dean; David L. Merithew; Philip A. Ragard, all of Binghamton, N.Y., and Crawford A. Matson, Wyalusing, Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,306
Int. Cl.³ B25B *5/08*
U.S. Cl. 227—46 **10 Claims**



1. An apparatus for sequencing of electronic components each of said components having at least one lead, said apparatus comprising:

a driven endless conveyor having a plurality of attached clip carriers, each of said clip carriers engageable in a positive gripping relation with at least one lead of an electronic component for transport of said component on said conveyor;

loading means for loading selected individual components into a clamping side of individual ones of said clip carriers by at least one lead in a preferred sequence;

unloading means for unloading said components from said clamping side of said clip carriers; and

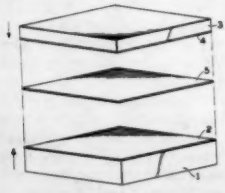
a control means for synchronizing operation of said apparatus.

4,398,659

METAL-COMPOSITE BONDING

Mark A. Richter, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 215,281, Dec. 12, 1980, Pat. No. 4,358,512.
This application Jan. 11, 1982, Ser. No. 338,824
Int. Cl.³ C03C *27/02, 27/04;* B32B *17/06*
U.S. Cl. 228—124 **7 Claims**



1. A method of bonding a high strength, thermally stable, graphite fiber reinforced glass matrix composite to a metal surface, the glass matrix having a low coefficient of thermal expansion and the graphite fiber having a highly negative axial coefficient of thermal expansion comprising depositing a thin layer of a eutectic alloy metal component to the bond surfaces of the composite and the metal, inserting a thin layer of eutectic alloy containing the metal component between the bond surfaces, placing the metal and composite bond surfaces together with the eutectic alloy in between and raising the temperature of the metal-alloy-composite to a temperature sufficient to melt the alloy and bond the composite.

4,398,660

METHOD OF MOUNTING ELECTRONIC COMPONENTS

Thomas R. Pampalone, Belle Mead, and Anthony Z. Miller, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 271,036
Int. Cl.³ B23K *31/02;* C09J *3/14*
U.S. Cl. 228—175 **9 Claims**

1. A method of mounting leadless electronic components on a printed circuit board comprising:

(a) temporarily attaching said components to said board with an adhesive composition comprising:

(1) 30 to 80% by weight of one or more liquid monomers each containing one or more acrylate moieties;

(2) a finely particulate inert filler;

(3) an effective amount of a free radical initiator containing a hydroperoxide moiety to allow partial curing of the adhesive composition upon exposure to gaseous sulfur dioxide;

(4) an effective amount of a thermal initiator to allow complete curing of the adhesive composition upon exposure to heat; and

(5) a polymeric binder soluble in said liquid monomers in an amount required to provide the desired flexibility and resiliency to the cured adhesive composition;

(b) exposing the board to gaseous sulfur dioxide to partially cure said adhesive composition;

(c) heating the board to complete the cure of said adhesive composition thereby rigidly attaching said components thereto; and

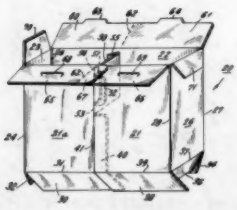
(d) soldering said components to said board.

4,398,661

INTERNALLY DIVIDED CARTON

Joseph F. Schillinger, Fulton, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 28, 1981, Ser. No. 315,934
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—27 **2 Claims**



1. A collapsible and erectable carton having a front wall, a back wall, and a pair of side walls interconnecting the front and back walls, said carton being in tubular form and formed from a single blank whose opposite edges are overlapped to form a medial seam traversing one of said front and back walls from top to bottom thereof;

said one of said front and back walls comprising two panels joined at said medial seam with the outermost one of said

two panels terminating at the mid line of said one of said front and back walls;

the innermost one of said two panels extending beyond said mid line of said one of said front and back walls to form a glue tab secured to the inner surface of said outermost one of said two panels;

a divider panel extending from an end of said innermost one of said two panels and foldably connected to said innermost one of said two panels along a fold line disposed along said mid line of said one of said front and back panels, said divider panel having a glue flap foldably connected to a terminal end of said divider panel with said glue flap being adhesively secured to a medial portion of the inner surface of the other of said front and back walls; and

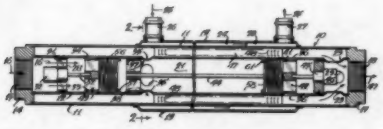
a portion of said glue tab being formed by material cut from said divider panel and extending beyond said fold line of said divider panel and adhesively secured to said inner surface of said outermost one of said two panels.

4,398,662

OIL TEMPERATURE REGULATOR

Norman F. Costello, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Oct. 16, 1981, Ser. No. 312,357
Int. Cl.³ G05D *23/12*
U.S. Cl. 236—34.5 **10 Claims**



1. An oil temperature regulator, comprising:

means providing an oil entrance to said regulator;

means providing an oil exit from said regulator;

by-pass first passage means through said regulator for said oil;

heat exchange second passage means separate from said first passage means;

a cooler in heat exchange relationship with said heat exchange second passage means for transfer of heat therebetween;

a first valve movable to open and close a first port between said oil entrance and said heat exchange second passage;

a second valve downstream from said first valve movable to open and close a second port between said by-pass first and heat exchange second passage means;

a third valve downstream from said second valve movable to open and close a third port between said by-pass first passage means and said oil exit;

first temperature responsive means at said entrance operable by said entering oil at a first temperature to open said normally closed first valve at said first temperature; and

second temperature responsive means operable by said exiting oil at a second temperature higher than said first temperature to open said normally closed second vaive and close said normally open third valve at said second temperature.

4,398,663

HEATING SYSTEM WITH STEAM RADIATORS

Richard A. Hegberg, Chicago, Ill., assignor to Tour & Andersson Aktiebolag, Stockholm, Sweden

Filed Jun. 5, 1981, Ser. No. 270,874
Int. Cl.³ F28D *1/00*
U.S. Cl. 237—9 R **7 Claims**

1. A building heating system with a plurality of steam radiators comprising:

a steam boiler;

a feeder conduit connecting said boiler to the radiators;

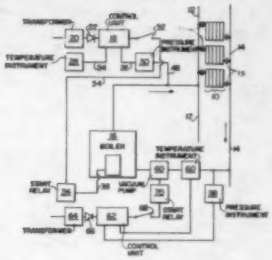
a return conduit connecting the radiators to said boiler;

a vacuum pump disposed in said return conduit for pumping condensed water from the radiators to said boiler;

a temperature sensing means for generating a signal indicative of the actual temperature outside of the building;

a steam pressure sensing means for generating a signal indicative of the actual pressure in said feeder conduit; and

a control unit, responsive to the signals generated by said temperature sensing means and said pressure sensing



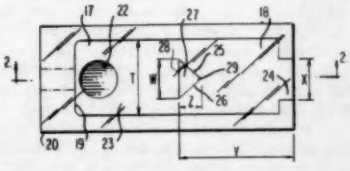
means, for providing an output signal in dependence upon a predetermined mutually dependent relationship between the outdoor temperature and feeder conduit pressure for shutting off said boiler when the pressure in said feeder conduit as sensed by said steam pressure sensing means exceeds a predetermined value determined by said predetermined relationship and corresponding to the specific actual temperature sensing means, and for starting said boiler when the pressure decreases to a value below the said predetermined value.

4,398,664

FLUID OSCILLATOR DEVICE AND METHOD

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidic Corporation, Silver Spring, Md.

Continuation-in-part of Ser. No. 952,910, Oct. 19, 1978, and Ser. No. 845,117, Oct. 25, 1977, Pat. No. 4,151,955. This application Mar. 30, 1981, Ser. No. 248,144
Int. Cl.³ B05B *1/08*; F15B *21/12*
U.S. Cl. 239—11 **2 Claims**



1. A liquid oscillator comprising,

a chamber,

liquid inlet means for introducing liquid under pressure into said chamber,

liquid outlet means for forming an outlet from said chamber to ambient,

means forming a pair of parallel liquid passageways in said chamber between said liquid inlet means and said liquid outlet means,

means in said chamber to create alternately pulsating vortices which increase and decrease in strength, associated with said parallel liquid passageways, respectively, which alternately block and pass fluid flow through said pair of

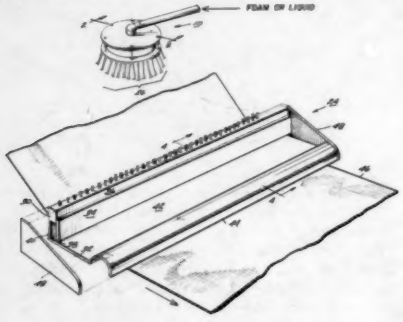
liquid passageways with the increasing and reducing strength of said vortices causing pulsating fluid flows through said passageways, respectively.

4,398,665

APPARATUS FOR UNIFORMLY APPLYING EITHER LIQUID OR FOAM COMPOSITIONS TO A MOVING WEB

Clifford A. Bryant, Dalton; Gary M. Bearden, Varnell, and Joseph A. Pacifici, La Grange, all of Ga., assignors to West Point Pepperell, Inc., West Point, Ga.

Filed Jun. 18, 1982, Ser. No. 390,114
Int. Cl.³ B05C 5/02
U.S. Cl. 239—193 **9 Claims**



1. Apparatus for applying liquid and foam compositions to a moving web, comprising:

a distributor to which said composition is supplied, said distributor being provided with a plurality of outlets;

an applicator joined to said distributor means by a plurality of conduits, each conduit being connected between a respective outlet in said distributor and a respective passageway in said applicator, the passageway being arranged in spaced relationship along one side of an elongated reservoir which forms a portion of said applicator, said applicator further including means for constricting flow of said composition from the passageways into said reservoir whereby individual streams of composition discharged from said passageways are merged into a sheet-like form for passage into said reservoir, said applicator further comprising a curved blade extending along the length of said reservoir on the opposite side thereof from said plurality of passageways, said blade being arranged such that as the reservoir fills with composition, an overflow of said composition passes over the crest of said blade and moves along the blade's curvature to be deposited uniformly across said web as the web moves in a direction normal to the length of said reservoir.

4,398,666

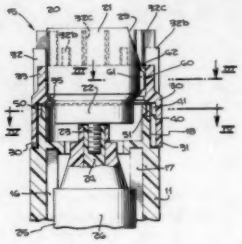
STREAM ROTOR SPRINKLER

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Filed Feb. 17, 1981, Ser. No. 234,642
Int. Cl.³ B05B 3/02
U.S. Cl. 239—222.13 **10 Claims**

1. In a stream rotor sprinkler having a rotating spray head and a crown type stream deflector positioned about the head, the improvement comprising the provision of:

means for mounting and driving said deflector in an eccentrically revolving continuous motion about and relative said head in incremental steps of a given amount less than



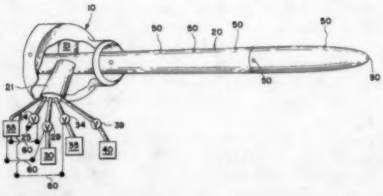
one full revolution in response to each revolution of said head.

4,398,667

APPARATUS AND METHOD FOR JET NOISE SUPPRESSION

Lucio Maestrello, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 753,971, Dec. 23, 1976, abandoned.
This application Feb. 27, 1981, Ser. No. 238,791
Int. Cl.³ B63H 25/46
U.S. Cl. 239—265.17 **17 Claims**



1. A method of directing the sound in a jet comprising the steps of:

(a) providing a jet exhaust nozzle;

(b) providing a porous centerbody internally along the entire nozzle length with a portion thereof extending rearward from the exhaust nozzle and downstream in the jet;

(c) injecting a cryogenic fluid coolant through the porous centerbody into the jet thereby;

(d) creating a heat sink along the jet extending downstream of the exhaust nozzle whereby the heat sink will attract acoustical energy in the jet and channel the jet noise in the direction of the heat sink.

4,398,668

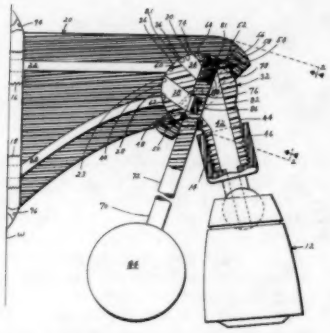
SHOWERHEAD CONTROL

Emile Jette, 1328 N.W. 110 Terrace, Miami, Fla. 33161

Continuation-in-part of Ser. No. 41,055, May 21, 1979, Pat. No. 4,311,279, which is a continuation-in-part of Ser. No. 971,051, Dec. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,200, Jan. 9, 1978, Pat. No. 4,273,289, which is a continuation-in-part of Ser. No. 863,694, Dec. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 818,441, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 790,277, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,766, Nov. 22, 1976, abandoned. This application May 26, 1981, Ser. No. 266,743

Int. Cl.³ B05B 7/12

U.S. Cl. 239—414 **8 Claims**



1. A showerhead control structure including means to control both waterflow and temperature therethrough for connection to a hot and a cold water line comprising:

(A) a showerarm adapted to be rigidly connected to a wall, said showerarm having separate hot and cold water ports extending longitudinally therethrough having respective hot and cold water water supply connection means, said hot and cold water ports discharging into a first ball and socket water flow control valve structure including a ball having separate hot and cold water through openings, a diametrical through bore in said ball extending transverse to said through openings having a connector recess at an upper end of said through bore, seal means in a lower portion of said through bore and said ball including a spherical valve surface portion providing substantially universal movement in the socket of said first ball and socket water flow control valve structure with respect to the hot and cold water discharge ports, said first ball and socket water flow control valve structure permitting water flow from said showerarm to said respective hot and cold water through openings in at least one universal position and the flow of water into said ball being blocked by said spherical valve surface in at least one other universal position, said first ball and socket water flow control valve structure including peripheral connector means for retaining said ball and socket in engagement, said first ball and socket water flow control valve structure having a combined hot and cold water flow passageway downstream of said diametrical through bore, said first ball and socket water flow control valve structure being provided with means for connection to a showerhead downstream of said ball,

(B) a second rotatable water flow control valve structure defined by an elongate control operator having a distal end and an upper end, said elongate control operator being journalled in said diametrical through bore, said upper end having spaced respective hot and cold water chordal cut-out means positioned to cooperate with respective downstream ends of said hot and cold water through openings to vary the water-flow temperature downstream of said elongate control operator upon rotational adjustment of said elongate control operator with respect to said ball when said first ball and socket water flow control valve structure is in a position permitting water flow from said showerarm to said ball.

4,398,669

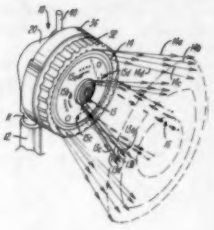
FLUID-SPRAY DISCHARGE APPARATUS

Stephen C. Fienhold, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Fort Collins, Colo.

Filed May 9, 1977, Ser. No. 794,958

Int. Cl.³ B05B 1/08

U.S. Cl. 239—447 **2 Claims**



1. In a fluid-spray discharge apparatus having a housing associated with a water inlet, a water outlet and means for effecting cyclic pulsation of water delivered from said inlet to said outlet, the improvement comprising:

means defining said outlet as a plurality of spaced apart water conveyances;

means associated with said housing for enabling selection of the number of said plurality of conveyances operative at any given time for the conveyance of the pulsating water;

an arrangement of water dischargers spaced from and in addition to said conveyances, and further means for selectively diverting water from said inlet as between said conveyances and said dischargers and in continuous flow to said dischargers;

a collection of water emitters spaced laterally from said conveyances in a direction opposite the spacing of said arrangement of dischargers, and further means for selectively channeling said water in continuous flow and as between said dischargers and said emitters;

said collection of emitters being disposed inside said conveyances and said arrangement of dischargers being disposed outside said conveyances;

said diverting means and channeling means together enabling the provision of water delivery from any of the combinations of entirely from said emitters, entirely from said dischargers, in a mixture from said emitters and said dischargers, entirely from said conveyances and in a mixture from said dischargers and said conveyances;

and a unitary member mounted within said housing and in which are defined a plurality of individual passageways respectively defining corresponding water communication for all different ones of said combinations upon rotational movement of respective portions of said housing.

2. In a fluid-spray discharge apparatus having a housing associated with a water inlet and a water outlet composed of water emitters, the improvement comprising:

said outlet including a nested stationary plurality of successively concentric rings, each ring including a circumferentially-spaced peripheral succession of forwardly-directed grooves each of which cooperates with a wall of a next-adjacent ring to define one of said emitters, and the respective grooves in different ones of said rings being at correspondingly-different angles so as, in the overall, to define

a spray pattern characterised by a plurality of concentric but progressively more-diverging cones;

and different ones of said rings each having an upstream lip projecting laterally toward the adjacent ring a distance to define a flow-loss orifice that results in a softening of the emitted spray.

4,398,670

FUEL INJECTION VALVE FOR AN INTERNAL COMBUSTION ENGINE

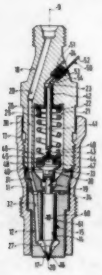
Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1981, Ser. No. 283,356

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029721

Int. Cl.³ F02M *61/20*

U.S. Cl. 239—533.9 **4 Claims**



1. Fuel injection valve for an internal combustion engine having

a valve body (**10, 11, 12, 13**) of electrically conductive material formed with a central opening (**21**);

an injection nozzle (**16, 28**) opening formed at the injection end of the valve body and having an internal sealing surface (**16**);

a reciprocable needle valve (**15–18**) located in the valve body and having a metallic valve pin (**18**) formed with a matching sealing face (**17**) to seal the nozzle opening when the sealing surfaces are in engagement, and to lift off the sealing surface to permit fuel to be injected;

a spring (**25**) retained in the central opening of the valve body and bearing against the needle valve to bias the needle valve into closed position;

guide surfaces (**14**) formed on the valve body and on the needle valve to guide the needle valve in its reciprocating movement;

means electrically insulating the needle valve from the valve body except in the region of the sealing surface;

and electrical connection means (**40, 41–46, 54**) connecting the needle valve to an external terminal (**50, 52**), electrically insulated (**51**) from the valve body;

wherein the needle valve (**15**) comprises a steel core (**18**) and an aluminum sleeve or jacket (**60**) secured to the steel core;

and an aluminum oxide insulating layer (**61**) formed on the outer surface of the sleeve or jacket to electrically separate the needle valve (**15–18**) and said valve body (**10–13**) when the needle valve is lifted off the sealing surface of the injection nozzle.

4,398,671

HOLDERS FOR CONTAINERS USED IN ELECTROSTATIC SPRAYING

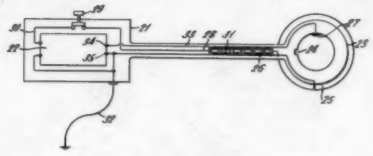
Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 78,434, Sep. 24, 1979, Pat. No. 4,275,846, which is a continuation-in-part of Ser. No. 953,774, Oct. 19, 1978, Pat. No. 4,209,134. This application Dec. 3, 1980, Ser. No. 212,743

Claims priority, application United Kingdom, Sep. 26, 1978, 38180/78; Dec. 21, 1979, 7944150

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—690 **2 Claims**



1. A holder suitable for receiving a container containing a liquid suitable for electrostatic spraying and having a spray orifice, said holder comprising a body having a high voltage generator; a power source therefor; a field-intensifying electrode; electrical connections for connecting the electrode to an output terminal of the high voltage generator and for connecting said one output terminal and said field-intensifying electrode to earth; mounting means complementary to mounting means on the container for locating the container on the holder with the spray orifice adjacent the electrode, said complementary mounting means having an electrical contact complementary to one on the container; and electrical connections for connecting said contact to the other output terminal of the high voltage generator.

4,398,672

ELECTROSTATIC SPRAYING

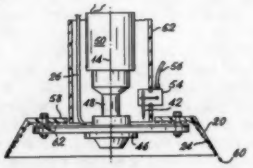
Arthur J. Arnold, Harpenden, and Barry J. Pye, Luton, both of England, assignors to National Research Development Corporation, London, United Kingdom

Filed Mar. 18, 1981, Ser. No. 245,209

Claims priority, application United Kingdom, Mar. 20, 1980, 8009366

Int. Cl.³ B05B *5/04*

U.S. Cl. 239—701 **15 Claims**



1. An apparatus for the electrostatic spraying of liquid, the apparatus comprising:

inlet means for admitting a supply of liquid;

a first rotatable member having a distribution surface, said surface being disposed to receive the liquid from the inlet means for centrifugal distribution;

a second rotatable member having an internal conical surface, said conical surface being disposed coaxially with said distribution surface to receive the liquid from said distribution surface for centrifugal atomisation from a circumferential edge of said conical surface, and said circumferential edge being disposed with respect to said

first member in that axial direction which is remote from said distribution surface;

means to support the first and second members in a spaced relationship to form a gap across which the centrifugal distribution occurs.

a terminal for the supply of electrostatic energy to an electrode means:

a said electrode means for conveying charge to a liquid layer at at least one of said distribution surface and said conical surface such that the spray of atomised particles from said circumferential edge is electrically charged;

an electrostatic feed path through the apparatus from said terminal to said electrode and onward to said circumferential edge including an air gap to electrically separate said edge from said terminal.

4,398,673

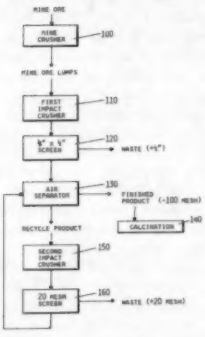
METHOD OF CLASSIFYING AND COMMINUTING A GYPSUM ORE OR THE LIKE

Walter L. Gonnason, Coopersville, Mich., assignor to Domtar Industries Inc., Montreal, Canada

Continuation-in-part of Ser. No. 158,947, Jun. 12, 1980, abandoned. This application Nov. 24, 1980, Ser. No. 210,011

Int. Cl.³ B02C *19/06, 23/08*

U.S. Cl. 241—5 **6 Claims**



1. A method of concentrating and comminuting the gypsum component of a gypsum ore having gypsum and chert components characterized by substantial differences in hardness, the steps comprising:

reducing the ore to a partially fragmented product by impaction at a velocity in the range of 7,800 to 9,800 feet per minute against a hard surface which will fracture a substantially greater proportion of the gypsum component;

separating by size the partially fragmented product into a first waste product and a first stage product, the first stage product being smaller in size than the first waste product, the particles of the first stage product being in the range of no greater than ¼ inch in cross section;

impacting said first stage product at a velocity in the range of 14,100 to 16,400 feet per minute against a hard surface which will fracture a substantially greater proportion of the gypsum component than of the chert component to produce a partially comminuted product;

separating by size the partially comminuted product into finished product, recycle product, and second waste product, the products being of increasing size from finished to second waste product, the particles of the finished product being in the range of no greater than 0.0058 inches in cross section, the particles of the second waste product being in the range of greater than 0.0331 inches in cross section; and

returning the recycle product to the impacting step.

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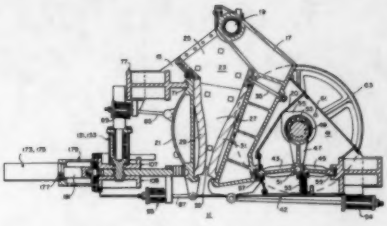
HYDRAULICALLY ACTUATED JAM RELEASE SYSTEM FOR A JAW TYPE CRUSHING APPARATUS

George H. Dremann, 1940 Hopkins St., Berkeley, Calif. 94707

Filed Aug. 6, 1981, Ser. No. 290,593

Int. Cl.³ B02C *1/02*

U.S. Cl. 241—30 **19 Claims**



1. In a jaw type crushing apparatus having a stationary frame, a crushing chamber defined by a stationary jaw and an opposing swing jaw downwardly hinged from hinge points in said frame, and means for reciprocating said swing jaw, a hydraulically actuated jam release system comprising

mechanically rigid, substantially horizontal retracting means having a forward end and a rearward end and at least one locking pin opening intermediate said forward and rearward ends, said retracting means being slidably disposed in said frame behind the lower end of said stationary jaw to that the forward end of said retracting means engages the lower end of said stationary jaw,

hold back means for holding said stationary jaw against the forward end of said retracting means whereby the stationary position of said stationary jaw is governed by the horizontal position of said retracting means,

at least one locking pin assembly having a locking pin substantially vertically disposed over said horizontal retracting means, said locking pin being in alignment with the locking pin opening in said retracting means when said retracting means is positioned in its substantially full forward position,

first hydraulic means for controllably raising and lowering said vertical locking pin to, respectively, disengage and engage the locking pin opening in said retracting means,

second hydraulic reciprocating means for controllably moving said retracting means horizontally in a forward and rearward direction of travel, and

valve means for actuating said first and second hydraulic reciprocating means to permit sequencing the movement of said horizontal retracting means and said vertically disposed locking pin to open and close said stationary jaw.

4,398,675

OSCILLATORY MILL

Friedrich W. Nette, Sachsenstrasse 26, 4030 Ratingen 6 (Hösel), Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,134

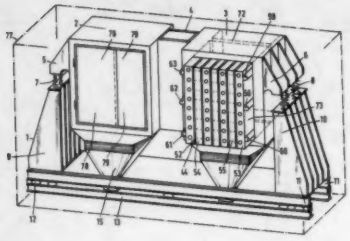
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3013987

Int. Cl.³ B02C *13/26*

U.S. Cl. 241—188 R **33 Claims**

1. An oscillatory mill, comprising at least one oscillatable container having at least one comminution zone; a housing arranged in said one comminution zone; at least one grinding member arranged in said housing and thereby in said one comminution zone and formed as an oscillatable hammer bar; at least one anvil bar arranged in said housing and thereby in said one comminution zone and having an impact surface cooperating with said one hammer bar so that the latter oscillates toward said impact surface of said anvil bar; a fixed abut-

ment arranged in said housing and thereby in said one comminution zone; and a spring element arranged in said housing and thereby in said one comminution zone so as to rest on said fixed



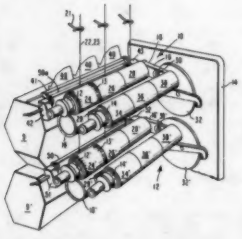
abutment and oscillatably mount said hammer bar, said hammer bar, anvil bar, spring element, abutment and housing together forming at least one block which is mounted exchangeable as a whole in said one oscillatable container.

4,398,676

TRANSFER TAIL WINDING DEVICE FOR TANDEM WINDUPS

Johannes E. A. Koppen, Dordrecht, Netherlands, and Samuel E. Workman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1981, Ser. No. 328,111
Int. Cl.³ B65H *54/02, 54/20*
U.S. Cl. 242—18 A **3 Claims**



1. In a winding apparatus having a pair of windups, one above the other; each windup including a drive roll, a pair of rotatable package supports alternately movable into surface driven engagement with the drive roll, a yarn source, and a self threading traverse guide through which yarn advances as packages are wound on said supports, said yarn being capable of adhering to the surface of a package support to initiate a new package; a centering guide means positioned above the windups to direct a yarn to the approximate center of the package support of each windup in surface driven engagement with its respective drive roll when the yarn are released from the traverse guides; a transfer tail device comprising a flat guide plate positioned between said centering guide and the traverse guide associated with the uppermost of said windups means mounting said guide plate for pivotal movement from a position out of contact with said yarns to a yarn engaging position in which the guide plate releases the yarns from the traverse guide associated with the uppermost of said windups, said guide plate having an outer peripheral edge around which the yarns traverse, to a location outside the path of travel of the traverse guides when the yarns are engaged by the guide plate; and means for releasing the yarn from the traverse guide associated with the lowermost of said windups.

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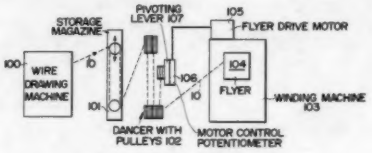
WINDING APPARATUS FOR STRAND TYPE MATERIALS

Werner Henrich, Henrich GmbH, Patentabteilung, Postfach 1240, 6348 Herborn, Hess, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 39,562, May 16, 1979, abandoned. This application May 13, 1981, Ser. No. 263,298
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823718
Int. Cl.³ B65H *54/00, 75/00*
U.S. Cl. 242—25 R **4 Claims**



1. An apparatus for continuously winding elongated material onto winding carrier means, comprising support means for exchangeably supporting said winding carrier means, winding means including flyer means and drive means (**105**) for said flyer means operatively supported by said support means, first magazine means (**101**) comprising block and tackle means (**101**) having a variable storing capacity and being operatively arranged upstream of said winding means as viewed in the travel direction of said elongated material for storing said elongated material at least during a time when a full winding carrier means is being exchanged for an empty winding carrier means, while said elongated material is continuously moving in said travel direction toward said winding means, second magazine means (**102**) comprising elongated material storing means of the dancer type (**102, 132**) operatively arranged downstream of said first magazine means and between said first magazine means (**101**) and said winding means, said first and second magazine means being arranged in series, said second dancer type magazine means (**102**) comprising movably supported pulley means (**128**) for sensing the instantaneous tension of the elongated material running from said first magazine means over said movable pulley means (**128**) of said dancer type magazine means (**102**), and speed control means (**106**) operatively connected to said movable pulley means of said dancer type second magazine means (**102**) for positively varying the speed of said flyer drive means (**105**), said dancer type second magazine means (**102**) having a smaller storage capacity than said first magazine means so that the dancer type second magazine means flexibly respond to the instantaneous operating condition of the apparatus to keep the tension of said elongated material substantially constant during an exchange of a winding carrier means and during a winding operation, and wherein said variable storage capacity of said first magazine means is not limited by the second magazine means.

4,398,678

VARIABLE-WIDTH WEB SLITTING AND WINDING APPARATUS

Martin W. Kron, and Victor I. Polz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1981, Ser. No. 258,833
Int. Cl.³ B65H *35/02, 17/08*
U.S. Cl. 242—56.3 **18 Claims**

1. A variable-width web slitting and winding apparatus comprising:

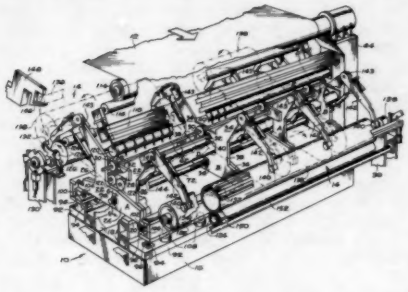
a longitudinally extending bed;

at least a pair of longitudinally spaced, parallel, and unitary plate-like slitter modules extending upwardly from and slidably mounted on said bed relative to one another, each

slitter module having a pair of rigid flanges extending inwardly toward one another in parallel spaced relation;

knife means rotatably mounted on each pair of said flanges of each slitter module for slitting a web fed through said knife means;

means coupled to said slitter modules for slidably adjusting said modules on said bed for varying the distance between said pair of slitter modules and knife means and hence the width of a first strip slit by said knife means;



a drivable first unitary winding drum parallel to said bed and laterally offset from one side of said pair of slitter modules;

first core supporting means on said slitter modules for rotatably supporting a first core and positioning the first core adjacent to said first drum; and

first guiding means for guiding the first slit strip between the first core and said first drum and onto the first core whereby the first slit strip is wound by said first drum onto the first core.

4,398,679

EXTERNALLY HOOKED STORAGE SPOOL FOR ROTARY WINDING ON AN UNWINDING

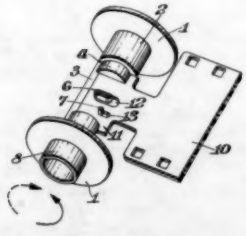
Achim Kluczynski, Overath, and Erik Altmann, Muelheim an der Ruhr, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 286,263

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029022

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—74 **7 Claims**



1. In combination with a storage spool,

a band shaped material for winding on the spool,

a cylindrical core of the spool which contains at least one core opening,

means externally positioned on the storage spool engageable with openings defined in the band-shaped material for hooking into the external engageable means, and wing-like catching members on the spool for catching the end of the band-shaped material while the spool rotates, the wing-like catching members being positioned axially on each side of the opening in the core,

said external engageable means being at least one hook and one means to prevent unhooking and being positioned in the opening in the core between said catching members,

a hammer-shaped cut at the end of the band,

and at least one hole defined in the hammer-shaped cut end for securing the band-shaped material to the spool and at least one hole defined in the cut end to prevent unhooking,

whereby catches and safety devices are provided to prevent unhooking of the band.

4,398,680

WEBBING LOCKING DEVICE

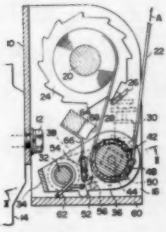
Hisashi Ogawa, Okazaki, and Hiroshi Tsuge, Chiryu, both of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Toyota and Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, both of, Japan

Filed Feb. 25, 1981, Ser. No. 237,989

Claims priority, application Japan, Mar. 3, 1980, 55-27251[U]

Int. Cl.³ B65H *75/48;* **A62B** *35/02*

U.S. Cl. 242—107.2 **6 Claims**



1. A webbing locking device used in a seatbelt system for protecting an occupant during a vehicular emergency comprising:

a frame secured to a vehicle body,

a takeup shaft rotatably supported on said frame and biased to rotate in a direction winding said webbing therearound, said takeup shaft having first emergency lock means for stopping the rotation of said takeup shaft in an emergency, and thereby allowing the tension in said webbing adjacent to said takeup shaft to be increased due to an inertial force generated in the occupant,

a rotatable plate pivotally supported on said frame,

a roller rotatably supported on said plate and having the intermediate portion of the webbing guided therearound, whereby during stopping the rotation of said takeup shaft, a tensile force of the webbing pivots said rotatable plate through said roller,

clamping means comprising a lock bar secured to said frame and adjacent to said roller for clamping the intermediate portion of the webbing between the circumference of said roller and said lock bar when said rotatable plate is pivoted, and

second lock means for stopping the rotation of said roller with respect to said rotatable plate, including a working arm projected from said frame, small ratchet wheels solidly secured to the roller and a small pawl pivotally supported on the rotatable plate, said small pawl being adapted to engage said working arm so as to be rotated when the rotatable plate is turned to thereby engage the small ratchet wheels.

4,398,681

THREAD BRAKE FOR CREELS

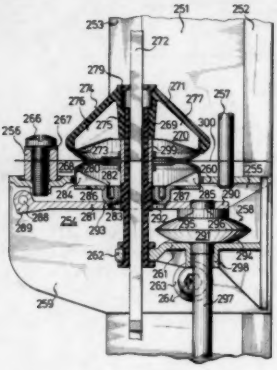
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 364,876

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1981, 3113829

Int. Cl.³ B65H *59/24, 77/00*

U.S. Cl. 242—150 R **20 Claims**



1. Thread brake for creels having at least one pair of braking discs with a central rotary drive and at least one separate rope friction body, comprising an adjustable loading device having a loading element, a common holding device for the rope friction body and for said adjustable loading device, the rotary drive having a central vertical shaft holding the pair of braking discs including an upper braking disc comprising a braking disc member and a disc holder secured thereto, sid disc holder being formed of plastic material and connected to the shaft so as to be fixed against rotation relative thereto and a lower braking disc resting on said loading element of said loading device.

4,398,682

DISPLACEMENT MECHANISM

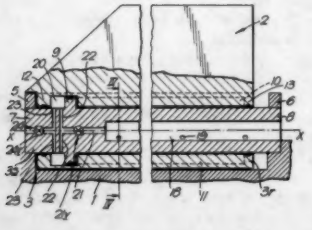
Alan R. Bithrey, Kensworth, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 11, 1980, Ser. No. 186,265

Claims priority, application United Kingdom, Sep. 18, 1979, 7931435

Int. Cl.³ F42B *13/32*

U.S. Cl. 244—3.29 **2 Claims**



1. A flight vehicle having:

body means;

fin means capable of rotary movement from an inoperative position to an operative position about an axis and of axial movement along said axis to effect locking;

displacement mechanism to effect such rotary and such axial movement; and

locking means to effect locking on such axial movement;

said displacement means including vaned stator shaft means fixedly carried by said vehicle body means;

vaned rotor cylinder means carrying said fin means, said stator shaft means extending co-axially through said rotor means in sealing engagement therewith to provide a torque and an axial force producing pressure fluid chamber and to also provide a further axial force producing pressure fluid chamber;

duct means for supplying pressure fluid to said torque and axial force producing pressure fluid chamber; and

further duct means for supplying pressure fluid to said further axial force producing pressure fluid chamber, said further duct means having valve means effective to supply pressure fluid to said further chamber thereby to prevent movement of said fin means until rotational movement is complete and subsequently to allow venting of said further chamber while supply of pressure fluid is continued to said torque and axial force producing pressure fluid chamber thereby to effect axial locking movement.

4,398,683

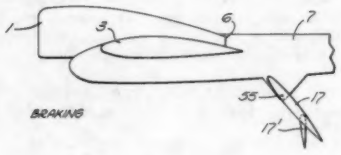
AIRCRAFT WITH THRUST AND LIFT AUGMENTING AIRFOIL

William M. Schmetzer, 15740 Sherman Way, Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 973,337, Dec. 26, 1978, abandoned, which is a division of Ser. No. 844,157, Oct. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,023, Aug. 19, 1976, abandoned. This application Jun. 2, 1980, Ser. No. 155,490

Int. Cl.³ B64C *21/04*

U.S. Cl. 244—12.5 **14 Claims**



1. An aircraft having a short field takeoff and landing capability comprising:

a fuselage;

a main wing attached to said fuselage;

a jet engine emitting substantially its entire exhaust stream at a location to flow rearwardly from above the trailing edge of said wing;

an auxiliary thrust augmenting airfoil which is lower than and offset rearwardly with respect to said wing; and

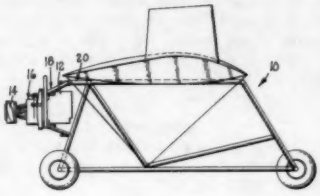
means mounting said thrust augmenting airfoil for adjusting movement relative to the fuselage and wing between a cruise position in which said airfoil is generally parallel to, but lower than, and spaced a substantial distance from the wing, and a takeoff position in which the airfoil is inclined at a downward and rearward angle of attack in a manner inducing downward and rearward movement of said exhaust stream by the Coanda Effect, with said airfoil in said takeoff position having its leading edge spaced rearwardly and downwardly from the trailing edge of the wing to define with said trailing edge a gap across which said exhaust stream flows in a relation drawing air through the gap from under the wing to attain thrust augmentation.

4,398,684

CONNECTING APPARATUS FOR A POWERPLANT

Dennis Von Ruden, Owatonna, Minn., assignor to Redro, Inc., Owatonna, Minn.

Filed Apr. 8, 1981, Ser. No. 252,153
Int. Cl.³ B64D 27/00, 35/00
U.S. Cl. 244—54 5 Claims



1. A connecting apparatus for an engine mounted to a structural frame, said engine for driving a rotary load, said engine having vibratory forces causing a greater torque in one direction than in a direction opposite therefrom, said apparatus comprising:

dynamically balanced means for isolating from said frame vibrations from said engine, said isolating means including a plurality of vibration dampening first mountings for more stiffly resisting engine vibration and a plurality of vibration dampening second mountings for less stiffly resisting engine vibrations, said first mountings being located rotationally advanced in the direction of greater vibratory force from said second mountings; and

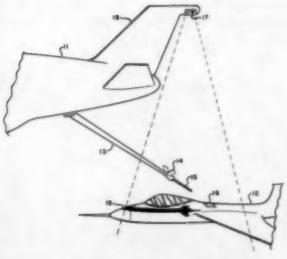
speed sensitive means for releasably coupling said engine to said rotary load.

4,398,685

AERIAL DAY/NIGHT REFUELING STATIONS

Harry L. Task, Dayton, Ohio; John F. Courtright, San Antonio, Tex., and Louis V. Genco, Enon, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,817
Int. Cl.³ B64D 39/00
U.S. Cl. 244—135 A 2 Claims



1. An aerial refueling system comprising:

a. a tanker aircraft having a refueling line depending rearwardly thereof;

b. a receiver aircraft having means thereon for engaging said refueling line;

c. infrared lighting means positioned on said tanker aircraft above said refueling line for illuminating said refueling line and receiver aircraft so as to cast a shadow of said refueling line on said receiver aircraft when said receiver aircraft is in close proximity to said line behind and below said tanker, said shadow serving as an indicia of the distance from said line to said engaging means on said receiver aircraft; and

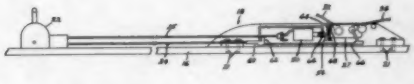
d. infrared sensitive viewing means disposed on said tanker aircraft through which said receiver aircraft, refueling line, and the shadow of said refueling line cast on said receiver aircraft by said infrared lighting means may be simultaneously viewed.

4,398,686

TOWPLATE SYSTEM

James E. Leger, Enon; Patrick J. O'Brien, Dayton, and Carl B. Mihlbachler, Fairborn, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 7, 1979, Ser. No. 73,478
Int. Cl.³ B64D 1/12
U.S. Cl. 244—137 R 8 Claims



1. In a towplate system for use in an aircraft cargo extraction system wherein a drogue parachute is first released and acts to deploy a main parachute of the cargo extraction system, said towplate system including a two-part force transfer link assembly having a first link member connected to the drogue parachute and a second line member connected to the main parachute, means for releasibly coupling said first link member to the second link member, a link release mechanism secured to said aircraft and being actuatable for holding and releasing said link assembly, means responsive to an electrical command input for electrically actuating said link release mechanism to release said two-part link assembly from said link release mechanism, means for mechanically actuating said link release mechanism to release said two-part link assembly from said link release mechanism, said link release mechanism accordingly releasing said two-part link assembly when actuated by either of said electrical or mechanical actuating means and thereby allowing said drogue parachute to extract said two-part link assembly and said main parachute therewith, and means for mechanically actuating said coupling means for releasing the first link member from the second link member to thereby jettison the drogue parachute, the improvement which comprises:

a control assembly common to both said means for mechanically actuating said link release mechanism and said means for mechanically actuating said coupling means, said control assembly being movable in a first direction for actuating said link release mechanism and in a second direction for actuating said coupling means, said control assembly being capable of movement in only one of said first and second directions at a time.

4,398,687

THRUST DEFLECTOR AND FORCE AUGMENTOR

James H. Nichols, Jr., Hyattsville, Md.; Roger J. Furey, Vienna, Va.; Robert J. Englar, Derwood, Md., and David G. Lee, Reston, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1981, Ser. No. 238,264
Int. Cl.³ B64C 21/04
U.S. Cl. 244—207 2 Claims

1. A thrust deflection, thrust reversal, and force augmentation device for an aircraft capable of short takeoff and landing and vertical takeoff and landing, comprising:

an aircraft wing;

a thrust engine mounted on said wing with the exhaust from said engine traveling over the upper surface of said wing;

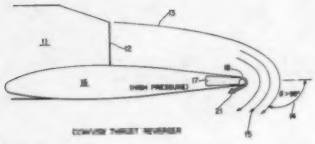
a plenum inside said wing having an inlet connected to a source of gas pressure and an outlet in the trailing edge of said wing;

said outlet being formed as a slot means between an upper portion and a lower portion:

said upper portion being a part of the upper surface of said wing and having a reduced thickness near the rear edge;

said lower portion forming the rear wall of the plenum, the lower edge of the slot and the rear edge of said wing, said lower portion being circular in cross section and having a constant radius of between 0.5% and 20% of the chord length of said wing;

said slot means having a smoothly converging nozzle with the portion of said nozzle having the minimum height



being at the rear edge of said upper portion, said slot means having a height of between 0.8% and 10% of said radius;

wherein gas from said source of gas pressure is controlled to travel through said plenum, escape through said converging nozzle and slot means and travel along the rear edge of said wing so as to cause said exhaust to be selectively deflected at an angle between 90° and 165° with the deflected exhaust retaining a substantial portion of the original thrust at angles of between 90° and 165°, so that the deflected exhaust acts substantially to slow down and lift the aircraft, allowing a short takeoff and landing capability for deflections near 90° and a vertical takeoff and landing capability for deflections greater than 90°.

4,398,688

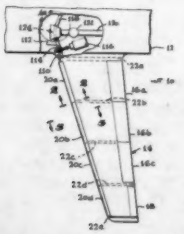
LEADING EDGE FLAP FOR AN AIRFOIL

Arthur L. Williams, Northridge, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 107,271, Dec. 26, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,851

Int. Cl.³ B64C *9/38*

U.S. Cl. 244—207 **15 Claims**



1. An extendable and retractable leading edge flap for an airfoil comprising:

a leading edge of the airfoil permanently located and rotatably mounted thereupon;

a first flap segment attached to said leading edge for rotation therewith and defining a portion of a lower surface of the airfoil when said flap is in a retracted position;

a second flap segment pivotally attached to said first flap segment and adapted to be stored within said airfoil when said second flap is in the retracted position; and

linkage means pivotally connecting said second flap segment and said airfoil;

whereby the rotation of said leading edge actuates said linkage means and extends said first and second flap segments form their retracted positions downwardly and forwardly of said leading edge, defining an aerodynamic extension of the upper surface of said airfoil and increasing its lift capacity.

4,398,689

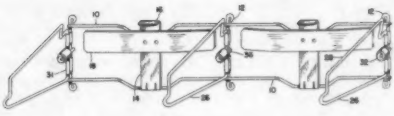
APPARATUS FOR LOADING BAGS

Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,214

Int. Cl.³ B64B *1/62*

U.S. Cl. 248—99 **13 Claims**



1. An apparatus for the loading of bags comprising:

a. a support frame;

b. means for retaining a stack of bags in spaced relation to said support frame; said stack retaining means including a support post having an end tab thereon, said post being tansversely affixed to said frame and a handle holder affixed to said post and said frame;

c. handle arms extending from, and hingedly attached to, said support frame; and

means for retaining said handle arms in a substantially perpendicular spaced relation to said support frame.

4,398,690

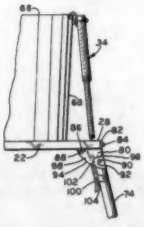
ELEVATED SUPPORT FOR PAILS, PAINT TRAYS, AND THE LIKE

Wayman R. Rutledge, 300 Fourth Ave., Jonesboro, Ind. 46938

Continuation-in-part of Ser. No. 91,177, Nov. 5, 1979, abandoned. This application Jun. 16, 1981, Ser. No. 274,235

Int. Cl.³ A47G *23/02*

U.S. Cl. 248—150 **16 Claims**



1. A container support comprising:

a platform having a top surface;

a plurality of legs depending from said platform for supporting said platform;

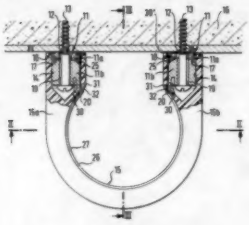
first means for releasably holding a pail-type container on said surface;

second means attached to said platform for releasably holding a paint roller tray to said top surface;
third means for removably attaching said first means to said platform;
fourth means for movably attaching said second means to said platform.

4,398,691
WALL BRACKET

Rudolf H. Wilke, 2 Marsberger Str., 3548 Arolsen, Fed. Rep. of Germany

Filed Jan. 14, 1981, Ser. No. 224,940
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001281
Int. Cl.³ E04G *3/08*
U.S. Cl. 248—235 **21 Claims**



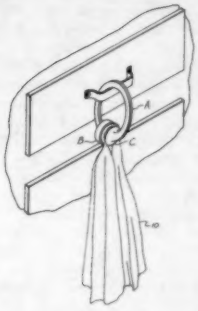
1. A bracket comprising a hoop-like part, in particular of moulded synthetic material and adapted to fittingly accommodate one or more articles which are to be supported by the bracket, and means for fixing first and second ends of said hoop-like part to a wall or surface, said means comprising first and second male supporting parts receivable in correspondingly shaped first and second cavities in said first and second ends and securable to said wall by respective fixing screws, and wherein each said male supporting part comprises a base part and a head part, said base part having a flat end face for mounting against said wall, a part spherical end face and a central screw hole extending between said flat end face and said part spherical end face, with said central screw hole having a diameter markedly larger than the diameter of an associated fixing screw and said head part having a part spherical end face complementary to the part spherical end face of said base part, a central screw hole, again markedly greater in diameter than the diameter of an associated fixing screw, and an outer profile complementary to the internal profile of the associated one of said cavities, there being further provided means for securing said hoop-like part to said head parts.

4,398,692
UTILITY DEVICE FOR SUSPENDING SHEET-LIKE MATERIAL

James P. Macfie, 115 Lausanne Dr., Camden, S.C. 29020

Filed Dec. 2, 1981, Ser. No. 326,670
Int. Cl.³ A47F *5/00*
U.S. Cl. 248—309 R **5 Claims**

1. A utility device for securing sheet-like material to an associated structure comprising:
a closed continuous ring-like element having a flexible ring means for encircling and attaching said device to an associated structure;
a socket closure means carried on a first end of said ring means having an interior opening defined by a socket exterior side wall and back wall;
a plug closure means carried on a second end of said ring means fitting within said socket closure means;
said ring means being constructed from a resilient material facilitating flexing of said ring means to an open position wherein said socket and plug closure means are pulled apart accommodating placement of said ring means over said associated structure;
said ring means flexing to a closed position in which said plug closure means is inserted in said socket closure means;
rim means extending about said socket opening periphery for catching said sheet-like material;
a material containing space defined by said peripheral side wall and back wall of said socket closure means, said rim means, and said plug closure means when inserted in said

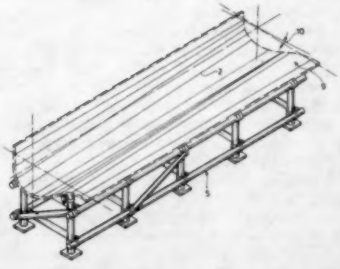


socket closure means in which said sheet-like material is gathered;
said plug closure means including a rounded plug body generally devoid of sharp edges having an enlarged blunt surface for pushing and packing said material into said material containing space beyond said rim means; and
said flexible ring means urging said plug and socket closure members together in said closed position and said gathered material being gripped between said rim means and plug body thereby securing said material, socket closure means, and plug closure means together.

4,398,693
MOLD HALF FOR LAMINATED PARTS

Michael Hahn; Peter Wackerle, both of Ottobrunn; Peter Eschenfelder, Faistenhaar, and Ralf-Thilo Schulz, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow - Blohm Gesellschaft mit Beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,194
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948690
Int. Cl.³ B28B *7/02*; B41B *11/60*
U.S. Cl. 249—155 **2 Claims**



1. A mold half particularly for laminated parts to be molded from composite fiber materials comprising:
a unitary sheet member which is produced from a material

blank by forming in said material blank a plurality of bends extending along straight lines, said straight line bends in said sheet member defining therebetween adjoining planar surfaces to form said sheet member in conformity with the contour of a part to be molded in a mold formed with said mold half being a part thereof;

said material blank from which said member is produced being formed from a development of said contour of said part to be molded;

said straight line bends being arranged to connect points on said contour which have equivalent tangential inclinations and which include plane surfaces therebetween; and

a support structure having said sheet member supported thereon, said support structure comprising

first fastening means comprising a single fastening member immovably fixed on said support structure,

second fastening means comprising a plurality of fastening members located along a first linear axis and arranged to be deflected in directions along said first axis, and

third fastening means comprising a plurality of fastening members located along a second linear axis parallel to said first linear axis, said fastening members of said third fastening means being arranged to be deflected in directions along said second linear axis as well as in directions transversely thereto,

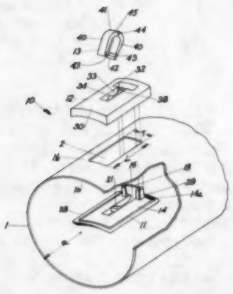
said single fastening member of said first fastening means being located along said first linear axis.

4,398,694

IRRIGATION PIPE GATE

Harold E. Damratowski, Alda, Nebr., assignor to Triad Corporation, Alda, Nebr.

Filed Apr. 24, 1981, Ser. No. 257,207
Int. Cl.³ F16K 3/22
U.S. Cl. 251—145 **17 Claims**



1. A slidable irrigation pipe gate for opening and closing an outlet port extending through the wall of a generally cylindrical irrigation pipe, said gate comprising:

a base member comprising an inner plate for slidingly abutting against the inside wall surface of the irrigation pipe with longitudinal and transverse dimensions exceeding those of the outlet port;

gasket means attached to said inner plate for providing a water tight slidable seal between the inner plate and the inside surface of the pipe;

a cover member comprising an outer plate for slidingly abutting the outside surface of the pipe; and

connecting means for connecting the base member and the cover member and urging them toward the inside surface and the outside surface, respectively, of the intervening pipe wall, said connecting means including upper and lower cross bar members attached to said cover and base members, respectively, and spring means readily insertable for assembly of the pipe gate and readily removable for disassembly of the pipe gate, said spring means comprising a U-shaped spring having a pair of spaced elongated generally parallel arms terminating in means configured to engage a corresponding one of said cross bar members to urge said base and cover members toward each other, said spring arms being connected by an arcuate portion,

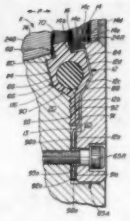
the pipe gate having a closed position wherein the outlet port is covered and an open position wherein a portion of the outlet port is not covered.

4,398,695

METAL SEAL STRUCTURE

Michael P. Torche, Garden Grove, Calif., assignor to MCC Flowseal, Huntington Beach, Calif.

Filed Dec. 29, 1981, Ser. No. 335,429
Int. Cl.³ F16K 1/22
U.S. Cl. 251—306 **8 Claims**



1. A seal structure for providing primary and secondary sealing of fluid between juxtaposed first and second members;

the first member having an annular peripheral sealing surface;

the second member having an annular surface normally slightly spaced from the first member;

one of said members having an annular interior cavity with an opening to its surface;

the cavity including sidewalls and a narrow anchoring recess extending from the ends of the convergent sidewalls;

a first annular seal ring mounted in said cavity having a main body portion with one side thereof adjacent to a cavity interior sidewall, said annular seal ring having an anchor portion extending from the main body portion into the anchoring recess and maintained in sealing relationship therein, said annular seal ring also having a lip radially projecting through said cavity opening and having a seat on the periphery of said lip engageable by the other of said members, said lip having a portion in sliding engagement with a surface on the one of said members having said cavity;

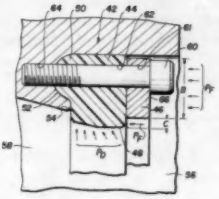
a second seal ring of relatively rigid, ductile material mounted in said cavity and having a main body portion, said second seal ring having an anchor portion extending from the main body portion into the anchoring recess and maintained in sealing relationship therein, said second seal ring also having a tongue radially projecting through said cavity opening and terminating in a seat engageable by the other of said members; and

the dimensions of the cavity and seal structures being such that when the seat on said lip portion of said first seal ring is engaged with the sealing surface the first seal ring is radially compressed and the lip is radially moved and the resulting radial compression operates the lip to effect sealing between said first and second members, and when the seat on the tongue of said second seal ring is engaged with the sealing surface the second seal ring is radially compressed and the tongue is radially moved and the resulting radial compression effects sealing between the first and second members.

4,398,696
BUTTERFLY VALVE

Dezso Szilagyi, Carnston; John P. Cunningham, Narragansett, and Robert L. Bowlby, Warwick, all of R.I., assignors to General Signal Corp., Stamford, Conn.

Filed Oct. 30, 1981, Ser. No. 316,798
Int. Cl.³ F16K 1/226
U.S. Cl. 251—307 5 Claims



1. In a butterfly valve including a body containing a through flow passage, and a pivoting disc which cooperates with a seat to control flow through the passage and which divides the passage into a first and second portion, an improved seat arrangement which comprises:

said first and second passage portions being displaced radially at said seat and interconnected by an annular radially extending wall having a height corresponding to said radial displacement of said first and second passage portions and a curvilinear axial annular recess which constitutes a substantial portion of said height and has a relatively large radius of curvature;

an endless elastomeric seat ring and a clamping ring each having a radially extending face and being abutted to each other along said radially extending faces, the radially extending face of said seat ring being flat over that entire surface, said clamping ring having an axially extending exterior wall with an outside diameter sufficiently less than the inside diameter of said first passage portion to allow said clamping ring to move axially in said first passage portion, and said seat ring includes an axially extending portion which engages and conforms to the shape of said axial annular recess;

a plurality of screw threaded elements spaced from one another in the direction of the circumference of the clamping ring and extending through apertures in said seat ring and said clamping ring and into said radially extending wall for adjustably forcing the clamping ring axially to thereby compress said seat ring and produce radially inward bulging of the seating surface; and

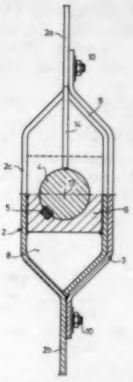
said first passage portion and said seat arrangement being configured so that said exterior wall of said clamping ring is uniformly exposed to fluid pressure in said first passage portion and exerts uniform pressure on said seat ring with said valve closed to uniformly increase the bulging of the seating surface so as to provide a tighter seal between said valve and said seat ring.

4,398,697
PIVOTAL FLAP

Hans-Jurgen Janich, Regelkamp 12, D-4720 Beckum, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,510
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022862
Int. Cl.³ F16K 1/22
U.S. Cl. 251—308 11 Claims

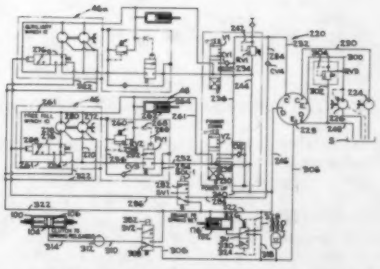
1. A rectilinear, pivotal shutoff control flap adapted for use in large. hot gas pipes comprises at least one mounting shaft rotatable about an axis; a pair of elongate vane sections extending longitudinally of said shaft and on opposite sides of said axis; and means connecting said vane sections to said shaft, said connecting means comprising at least one hub member fixed to said shaft, an elongate shell member carried by said hub member and extending longitudinally of said shaft, said shell member being of distortion resistant shape having opposite ends extending on opposite sides of said axis toward said vane sections and having a central section spaced transversely to one side of said axis and said shaft, and means coupling the opposite ends of said shell member to respective ones of said vane sections and enabling limited relative movement therebetween longitudinally of said shaft.



4,398,698
FREEFALL WINCH SYSTEM AND METHOD OF OPERATION

Steven C. Crawford, Lexington; Thomas J. Feltman, Winchester, and Roger A. Steuck, Nicholasville, all of Ky., assignors to FMC Corporation, Chicago, Ill.

Filed May 29, 1981, Ser. No. 268,315
Int. Cl.³ B66D 1/08, 5/06
U.S. Cl. 254—291 15 Claims



1. In a freefall system for a crane or the like, said system including a frame, a drum shaft journaled on said frame, a drum journaled on said shaft and having a cable trained therearound for selectively raising and lowering a load, clutch means for selectively interconnecting the drum and the drum shaft, a clutch releasing circuit having switch means therein, brake means for selectively resisting and allowing rotation of said drum relative to said frame, means for selectively driving said drum shaft in load raising and load lowering directions: the improvement which comprises first control means for releasing said brake means; depressible manually operated brake actuating means for overriding said first control means for applying a drum braking force; and second control means including said switch means in said clutch releasing circuit for

releasing said clutch, said second control means being effective to release said clutch means when said manual brake actuating means is partially depressed and when said switch means in said clutch releasing circuit is manually held closed.

4,398,699

DEVICE FOR REMOVING FUSED SLAGS ON SLABS

Sadayuki Saito, Inba; Ichiro Fukunaga, Chiba; Susumu Ito, Chiba; Katsumi Nakamura, Chiba, and Kazuya Higuchi, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

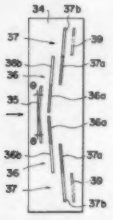
PCT No. PCT/JP81/00327, § 371 Date Jun. 29, 1982, § 102(e) Date Jun. 29, 1982

PCT Filed Nov. 11, 1981, Ser. No. 395,006

Claims priority, application Japan, Nov. 11, 1980, 55-161319; Nov. 18, 1980, 55-165141; May 29, 1982, 56-81162

Int. Cl.³ B23K *7/02*

U.S. Cl. 266—50 **6 Claims**



1. A device for removing fused slags on slabs as said slabs are transferred in a transferring direction, comprising:

a tool rest which is movable in an upward direction perpendicular to said transferring direction;

at least a front and rear <-shaped cutters with a center of said front and rear <shaped cutter being the apex of said < and disposed in front and rear positions of said tool rest with said apex facing in a direction opposite to said transferring direction;

at least a spring mounted in said tool rest for biasing said rear cutter in said upward direction; and

a shear point of said rear cutter projects upwardly somewhat higher than that of the front cutter in order to cut out the fused slags on said slab during the transferring process of the slab of a predetermined length.

4,398,700

ANNEALING FURNACE WITH AN IMPROVED COOLING SECTION

William L. Thome, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 29, 1982, Ser. No. 426,871

Int. Cl.³ C21D *9/573*

U.S. Cl. 266—111 **13 Claims**

9. An annealing furnace, comprising a heating section, a soaking section and a cooling section through which a continuous strip of metal is successively passed, the cooling section including:

(a) a vertically elongated chamber having at least one pair of oppositely extending wings which project laterally from the chamber and which are defined by at least three sidewalls and a floor;

(b) means for directing a continuous strip of metal vertically through the chamber;

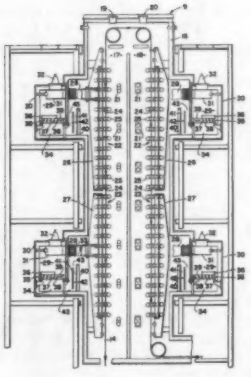
(c) a plurality of nozzles horizontally disposed on opposite sides of the strip of metal for impinging streams of gas against adjacent sides of the strip of metal;

(d) a pair of vertically disposed plenums communicating with the nozzles, the plenums positioned between the nozzles and the laterally extending wings, the plenums each including a communicating supply duct which extends horizontally into the closest adjacent wing and a compartment that is formed in the wing and sealed from the chamber, except for a fluid inlet through which gas from the chamber enters the compartment, the fluid inlet being spaced vertically above the floor of the wing in which the compartment is located, each compartment also having a fluid outlet through which gas passes from the compartment into an adjacent supply duct;

(e) a heat exchanger horizontally disposed in each compartment in spaced vertical relation above the fluid inlet, the heat exchanger being smaller, in size, than the fluid inlet so that a bypass opening is formed for allowing gas to enter the fluid inlet and bypass the heat exchanger as the gas moves into the compartment;

(f) means for continuously circulating cooling liquid through the heat exchanger during operation of the cooling section of the furnace;

(g) two sets of dampers positioned between the inlet opening and heat exchanger and bypass opening and capable of alternately (i) closing the inlet opening, (ii) allowing gas to enter the compartment via the inlet opening and heat exchanger where the gas is brought into heat exchanging relation with the cooling liquid circulating through the heat exchanger, and (iii) allowing gas to enter the compartment via the fluid inlet and bypass opening;



(h) a solid, gas impervious baffle extending vertically from the floor of each wing in horizontal spaced relation from the adjacent compartment formed in the wing, each baffle being closer the chamber than the adjacent compartment and terminating vertically above the heat exchanger in the adjacent compartment, the baffles forming with the compartments and floors and sidewalls of the wings, fluid passageways leading to the inlet openings in the compartments, the baffles also forming in each of the wings, a cold sink to prevent the backflow of gas from the compartment through the heat exchanger into the chamber; and

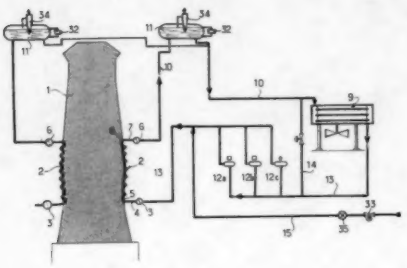
(i) a fan coacting with each horizontal supply duct for drawing gas from the communicating compartment through the fluid inlet into the supply duct for circulation, under pressure to the plenum and communicating nozzles.

4,398,701

COOLING INSTALLATION FOR A BLAST FURNACE BY MEANS OF STAVE COOLERS

Jean Cordier, Dunkerque, and Pierre Rollot, Malo-les-Bains, both of France, assignors to Union Siderurgique du Nord et de l'Est de la France "USINOR", Paris, France

Filed Jul. 22, 1981, Ser. No. 285,334
Claims priority, application France, Jul. 22, 1980, 80 16105
Int. Cl.³ C21B 7/10
U.S. Cl. 266—193 5 Claims



1. A cooling installation for a blast furnace including, a plurality of stave coolers arranged in a plurality of successive superimposed rings along the internal wall of the blast furnace, to define a plurality of different horizontal levels of cooling staves, said plurality of successive superimposed rings of stave coolers corresponding to different levels in the blast furnace which are subjected, during normal operation of said blast furnace, to different amounts of heat;

means for variably cooling, during normal operation of said blast furnace, said different levels in correspondance with, and to counteract, said different amounts of heat, the number of levels being variably cooled being greater than two;

said cooling means including a plurality of relatively vertical internal circulation tubes for cooling fluid included in the stave coolers, the number of said tubes in the various said superimposed rings of stave coolers being different, with increased numbers of tubes being located in those rings subjected to relatively greater amounts of heat during normal operation;

said increased number of tubes being provided by the fact that the widths of said stave coolers differ in the various said superimposed rings of stave coolers, with the relatively narrow stave coolers being arranged in the said levels subjected to the relatively higher amounts of heat;

an external circuit means for cooling and maintaining the cooling fluid in a liquid state, including a plurality of supply lines and return lines, with the number of supply lines and return lines for various of said levels varying in accordance with the different numbers of said tubes.

4,398,702

METALLURGICAL FURNACE

Roy C. Lueth, St. Clair, Mich., assignor to Ultra-Temp Corporation, Sterling Hgts., Mich.

Filed Mar. 22, 1982, Ser. No. 360,337
Int. Cl.³ C22B 60/04
U.S. Cl. 266—208 14 Claims

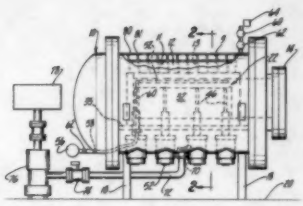
1. A device for liquid phase sintering of preforms, said preforms initially comprising powdered material cohesively held together by a fugitive binder, said device comprising:

a pressure vessel defining an interior pressure chamber;

a furnace contained within said pressure chamber, said furnace comprising a top wall, a bottom wall and side and/or end walls which together form a substantially closed furnace chamber, said top wall and each side and/or end wall having a predefined area,

each of said furnace walls comprising at least one layer of thermal insulation,

said furnace top wall and each of said furnace side and/or end walls comprising a vapor barrier which extends across the entire area of its respective top, side and/or end wall,



means for heating said furnace chamber and furnace walls above the vaporization temperature of the fugitive binder,

means for enabling a gas to escape through said bottom wall,

means for condensating vaporized fugitive binder on the pressure vessel,

means for selectively providing access to said furnace chamber, and

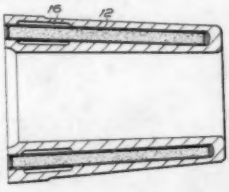
means for pressurizing said interior pressure chamber.

4,398,703

TUYERES WITH HEAT PIPES AND METHOD OF MANUFACTURING

Raymond N. Elderfield, Sheffield, England, assignor to Carblox Limited, Sheffield, England

Filed Apr. 15, 1981, Ser. No. 254,531
Claims priority, application United Kingdom, Apr. 24, 1980, 8013470
Int. Cl.³ C21B 7/16
U.S. Cl. 266—270 6 Claims



1. A method of manufacturing a tuyere for use in a blast furnace, the method comprising the step of casting in a mold a tuyere body with one or more cast-in tubes so that said tube(s) extend generally longitudinally of said tuyere body between its wall thickness, and thus extend rearwardly from near a nose portion of said body, and the subsequent step of forming in situ a low pressure, boiling/condensing heat pipe of each of said tube(s) by installing a wick material, evacuating the tube(s), introducing a working fluid, and sealing the tube(s).

4,398,704

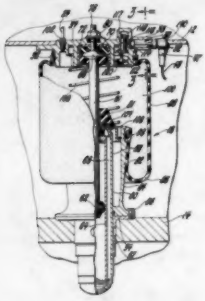
VEHICLE PNEUMATIC SUSPENSION SYSTEM WITH DEAD BAND ADJUSTMENT

Harry C. Buchanan, Jr., Spring Valley; Donald E. Graham, Centerville; Keith R. Cook, Xenia, and George T. Claude, Bellbrook, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 57,793, Jul. 16, 1979, abandoned. This application Jan. 26, 1982, Ser. No. 342,676

Int. Cl.³ F16F *9/50*

U.S. Cl. 267—64.21 **7 Claims**



1. A leveling system for a vehicle having sprung and unsprung masses comprising a source of gas pressure, gas spring suspension means operatively connected to said source of gas pressure and yieldably interconnecting said sprung and unsprung masses, said gas spring suspension means having polymeric cylindrical sleeve means providing variable volume gas column between said sprung and unsprung masses of said vehicle, exhaust valve means operatively connected to said gas column operable to exhaust pressurized gas therefrom, magnetic means movably mounted within said sleeve means and operatively connected to one of said masses for indicating the relative position of said sprung and unsprung masses, and a Hall effect device adjustably positioned on said gas spring suspension means externally of said sleeve, control means operatively connected to said Hall effect device and to said source of gas pressure and further to said exhaust valve means and responding to output from said Hall effect device as triggered by the flux field of said magnetic means for controlling the spacing between said masses, axially movable mounting means for axially positioning said Hall effect device at a selected adjusted position adjacent the face of said magnet means and within the flux field thereof to thereby establish a dead band zone having a width in which the Hall effect device effects maintenance of said gas pressure in said column by maintaining said exhaust valve means in a closed position and ensuring that said gas spring volume is closed with respect to said source.

4,398,705

BOX SPRING ASSEMBLY WITH INTERLOCKED FORMED WIRE SPRING COMPONENTS HAVING LIMITED DEFLECTION CAPABILITIES

Ned W. Mizelle, High Point, N.C., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

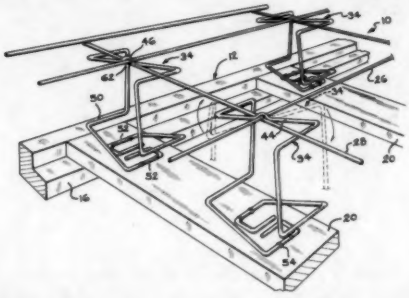
Filed Mar. 5, 1981, Ser. No. 240,763

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ F16F *3/00;* **A47C** *23/02*

U.S. Cl. 267—85 **5 Claims**

1. In a box spring assembly which includes a generally horizontal rectangular frame having corners and a generally horizontal spring wire mattress support deck disposed a predetermined distance above said frame, said deck including a plurality of staight wires arranged criss-cross fashion, some of said wires extending lengthwise of said frame and others of said wires extending crosswise of said frame and a border wire having corner portions located above and substantially vertically aligned with the corners of said frame; a plurality of deck support springs arranged between said deck and said frame so as to yieldably support said deck on said frame, each of said springs including a vertically yieldable portion secured at the lower end to said frame and terminating at the upper end in a deck-attaching portion, each said deck attaching portion including a pair of generally parallel spaced wire sections and a connecting wire section integral with and extending diagonally between said spaced wire sections, each said attaching portion



being located so that a mid portion of the connecting wire section therein is at the juncture of a lengthwise wire with a crosswise wire in said deck and the parallel wire sections extend crosswise of one of said crosswise or lengthwise wires on opposite sides of said juncture, said parallel wire sections and said connecting wire section being located on opposite top and bottom sides of the deck wires at said juncture so as to clamp said spring to said deck, and corner springs supported on and projecting upwardly from said frame corners, each said corner spring including an upright sinuous body terminating at the upper end thereof in an attaching portion arranged side-by-side with a border wire corner portion and attaching means connecting said side-by-side portions.

4,398,706

WORK-HOLDING CLAMP WITH PIVOTABLE AND SLIDEABLE CLAMPING SCREWS

Herbert E. Kaulfuss, 3903 Barrington Dr. #1901, San Antonio, Tex. 78217

Filed Mar. 4, 1982, Ser. No. 354,889

Int. Cl.³ B25B *1/20*

U.S. Cl. 269—88 **7 Claims**

1. A clamp comprising:

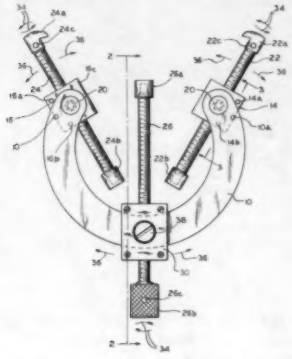
two C-shaped plates, aligned and arranged in planes parallel to each other;

support means for assuring uniform separation between said plates throughout their length;

two screws for applying clamping pressure, each of which is pivotably attached to said two plates, one screw at each end of the C-shape of said plates; and

a third screw for applying clamping pressure slidably attached between said two plates, slidable to an infinite number of points between the ends of the C-shape of said plates, and lockable at each of those points by means of a

set screw, between the ends of the C-shape of said plates, such that as its means of attachment is slid around the



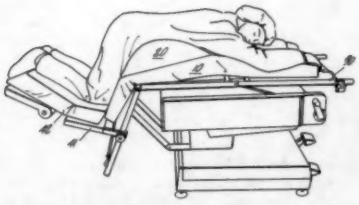
C-shape, the angle of said third screw with respect to said plates changes.

4,398,707

SURGICAL SADDLE

Ralph B. Cloward, 1111 Bishop St., Suite 510, Honolulu, Hi. 96813

Filed Sep. 16, 1981, Ser. No. 302,803
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 **13 Claims**



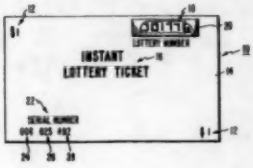
1. A surgical saddle, attachable to a standard operating table, upon which the patient to be operated upon will be positioned, comprising a base pad; means for securing said base pad to the operating table; a pair of ridges attached to said base pad, said ridges positioned longitudinally along said base pad, substantially aligned but separated from one another, and extending an equal distance above and perpendicular to said base pad; and means for adjusting the distance between said ridges, said means comprising an aperture in said base pad located between said ridges, and means for adjusting the relative length and width of said aperture such that as the length of said aperture is increased, said width is decreased, thereby pulling said ridges closer together.

4,398,708

METHOD OF FABRICATING AND SECURING PLAYING CARDS FOR INSTANT LOTTERIES AND GAMES

Max Goldman, 134 S. Mansfield Rd., and Carl Alexoff, 539 Tarington Ct., both of Cherry Hill, N.J. 08033

Division of Ser. No. 763,639, Jan. 28, 1977, Pat. No. 4,191,376, which is a continuation-in-part of Ser. No. 580,604, May 27, 1975, abandoned. This application Dec. 17, 1979, Ser. No. 104,118
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.³ B41F *13/64;* A63B *71/06*
U.S. Cl. 270—18 **16 Claims**



1. A method of manufacturing and using lots of physically connected instant lottery tickets for lotteries and other games, each having a serial number and a lottery number seemingly randomly associated with the serial number, said lottery number being indiscernible after the playing card is fabricated and when given to the player but transformable by the player to be intelligible for comparison with known winning lottery numbers, said method comprising;

feeding a continuous strip of ticket material through a computer-controlled printer;

imprinting under computer control different lottery numbers in a seemingly randomized way on successive portions of said ticket strip corresponding to individual tickets and rendering said lottery numbers indiscernible;

and imprinting serial numbers on said ticket card portions under computer control seemingly randomly associated with the lottery numbers;

said serial numbers being imprinted on successive physically connected ones of said lottery tickets with the serial numbers being sequential within each of a plurality of lots of tickets and providing an inventory control of the tickets in each of said lots;

said lottery numbers being imprinted on said lottery tickets with each of the lottery numbers being correlated seemingly randomly to the serial number of the same ticket by a certain computer algorithm;

said imprinting of lottery numbers including imprinting on said physically connected tickets in said lots a certain quantity of winning ones of said lottery numbers in a particular game, the winning lottery numbers being seemingly randomly distributed among said physically connected tickets of said lots without physical manipulation of said tickets and correlated with said serial numbers by a computer algorithm associated with said lottery number algorithm;

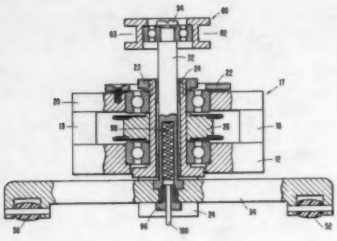
and testing for correlation between the lottery numbers and the associated serial numbers of said tickets to validate winning lottery numbers and detect altered or counterfeit lottery numbers;

whereby a reliable lottery is economically established in the ticket fabrication by the ability to validate winning lottery tickets, by the distribution and dispensing of tickets being accounted for by serial numbers, and by the assurance to players and ticket dispensers of a certain number of winning lottery tickets in seemingly random relation to non-winning tickets.

4,398,709
WAVE GENERATION AMPLIFICATION APPARATUS FOR CUT SHEET PAPER FEEDING

Donovan M. Janssen; Robert Magno, and William S. Seaward, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,931
Int. Cl.³ B65H *3/06, 9/16*
U.S. Cl. 271—10 **9 Claims**



1. A sheet shingling device for shingling sheets in seriatim from a stack onto a processing station of a utilization apparatus, comprising:

means operable to support a stack of sheets;

a rotary shingler member including free-rolling means disposed to contact the stack periodically, and to rotate in a plane substantially parallel to the plane of the top sheet in the stack;

force application means, comprising a pin and a coil spring connected to said pin, carried by said shingler member and disposed at the center point of a circular orbit generated by said free-rolling means, said pin being spring biased to contact the stack prior to contact by said free rolling means, to thereby impart a restraining force to said sheets prior to a shingling force being imparted to said sheets, so that sheets are shingled at a constant angle from said stack;

sheet feed means disposed relative to the stack, said sheet feed means being operable to receive the shingled sheets, and to reorientate the sheets to conform to a predetermined paper path; and

sheet aligner means disposed within the paper path, said sheet aligner means being operable to align a sheet traversing said path.

4,398,710
METHOD AND APPARATUS FOR OPENING FOLDED, BOUND OR STITCHED MULTI-SHEET PRODUCTS, ESPECIALLY PRINTED PRODUCTS

Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Dec. 8, 1980, Ser. No. 214,460
Claims priority, application Switzerland, Jan. 8, 1980, 100/80
Int. Cl.³ B65H *5/30*
U.S. Cl. 270—55 **22 Claims**

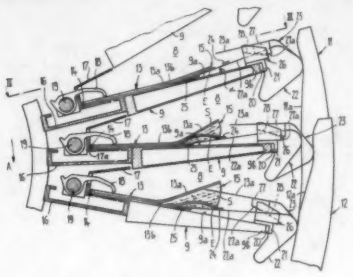
1. A method of opening folded, bound or stitched, multi-sheet products, especially printed products, each having a folded edge and an opposite open side having a lap margin part, comprising the steps of:

moving a pre-separation element relative to the product towards the open side thereof and engaging an edge of the lap margin part of said open side;

moving the engaged lap margin edge of the open side relative to and toward said folded edge;

continuing the relative movement of the pre-separation element and the lap margin edge engaged thereby so that there occurs a bowing-out of the sheets;

inserting a holder element into an opening formed between the bowed-out sheets and remaining sheets of the product not engaged by the pre-separation element; and

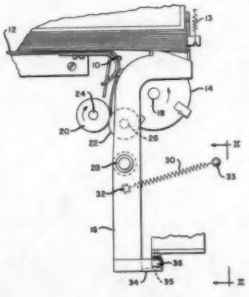


bringing to bear the sheets of the product not engaged by the pre-separation element against the holder element.

4,398,711
CURRENCY DISPENSER MONITOR

William R. Horst, Dayton, and Robert H. Granzow, Miamisburg, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 108,874, Dec. 31, 1979, abandoned.
This application Aug. 7, 1981, Ser. No. 290,895
Int. Cl.³ B65H *7/14, 7/12*
U.S. Cl. 271—263 **30 Claims**



1. An apparatus for detecting the passing of record members in a transport system, said apparatus comprising:

means for gauging the thickness of record members as said members move along a predetermined path;

means for detecting a displacement of said gauging means;

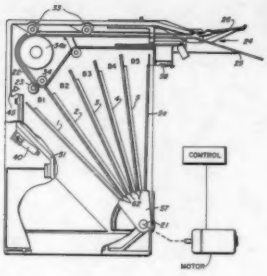
means, coupled to said gauging means, for modulating said detecting means relative to the magnitude of displacement from the static position of said gauging means in a manner which allows for variation of said static position; and

circuit means responsive to said detecting means for generating a plurality of signals which are utilized to indicate certain conditions when said record members pass through said gauging means, said circuit means including means for inhibiting a voltage representative of the static position of said gauging means and producing a voltage representative of the differential movement of said gauging means.

4,398,712
SHEET SORTERS

Clifford L. George, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1981, Ser. No. 268,548
Int. Cl.³ B65H 39/105, 39/11
U.S. Cl. 271—293 12 Claims



1. A sheet sorter comprising a plurality of sheet receiving bins,

said plurality of sheet receiving bins comprising an array of movable plates such that adjacent plates define an individual bin,

a quadrant plate for indexing the input ends of the bin plates past a fixed feed throat to align the bin opening in line with the feed throat for sheet insertion, said quadrant plate being rotatable about an axis, having the end of said movable bin plates opposite said input ends attached thereto defining a plurality of sheet receiving bins, and having the last bin plate firmly fixed to said quadrant plate with the other bin plates being movably connected to said quadrant plate;

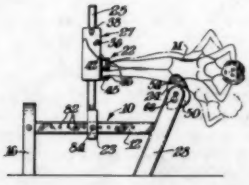
adjacent bin plates being movable apart and together for varying the sizes of the bin openings,

said bin plates being interconnected to limit their maximum spacing apart, said bin plates being spaced apart opposite and at one side of the feed throat and being spaced together when indexed past the feed throat to the other side of the feed throat.

4,398,713
EXERCISING DEVICE

Charles R. Ellis, 309 William St., Salisbury, Md. 21801

Filed Aug. 3, 1981, Ser. No. 289,416
Int. Cl.³ A63B 23/02
U.S. Cl. 272—145 16 Claims

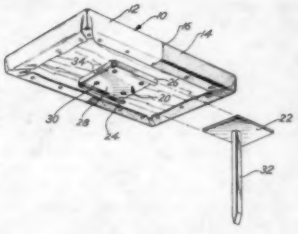


1. A device for selectively permitting the user to do sit-up and back extension and lateral extension exercises comprising a horizontal runner, a foot support assembly mounted to said horizontal runner, said foot support assembly comprising a first feet confining means for holding the user's feet generally stationary while the user's feet are disposed upwardly in the sit-up condition, a second feet confining means for holding the user's feet generally stationary while the user's feet are disposed downwardly in the back extension condition, a third feet confining means for holding the user's feet generally stationary while the user's feet are disposed in a sideways direction in the lateral extension condition, a pelvic support member mounted to said horizontal runner spaced from said foot support assembly, means for rotating said pelvic support member to one of a plurality of selected operative positions, said pelvic support member having a generally flat surface for supporting the user's pelvis in the sit-up condition to comprise one of said operative positions, said support member having a second surface for supporting the user's pelvis in the back extension condition to comprise another of said operative positions, said support member having a third surface for supporting the user's pelvis in the lateral extension condition to comprise a further of said operative positions, at least one of said second and said third surfaces being rounded, a pair of spaced upstanding projections extending outwardly away from said third surface to form a saddle in which the user's pelvis may be positioned for minimizing any tendency of the body of the user to twist or roll while providing support therefor, said saddle including means for accommodating different sized users, and said foot support assembly and said pelvic support member comprising the sole means for supporting the user's body whereby the user's body is thereby otherwise unsupported to maximize the degree of flexion and resistance and range of motion during the various exercises.

4,398,714
BALL BASE CONSTRUCTION AND ANCHOR

Charles C. Fuller, and James L. Hendrickson, both of Washington, Ill., assignors to Safe-Base, Inc., Washington, Ill.

Filed Mar. 9, 1981, Ser. No. 242,160
Int. Cl.³ A63B 71/02
U.S. Cl. 273—25 2 Claims



1. An improved ball base comprising, in combination:

a unitary base pad member having a rectangular shape and divided into two substantially square or rectangular subsections, the paid member further comprising a pad support and a pad cover, each of said subsections including visually distinctive and different coloring of the covering of each subsection, each subsection being monochromatic with one subsection being substantially white and the other being a distinctive, bright color; and

means for attaching the pad member to the ground to retain one subsection inside an imaginary line defined as the foul line and the other subsection simultaneously outside said line, whereby a runner may tag the outside subsection and a baseman can tag the inside subsection, said means for attaching comprising cooperative plates attached respectively to the bottom center of the base and to a rod member which projects into the ground, the plate attached to the base having side flanges and an end flange, with the side flanges formed into grooves matable with the second plate to slidably receive the second plate, the end flange comprising a stop flange perpendicular to the side flanges, the plates being mounted to slide transverse to the direction of an incoming base runner whereby a thrust from a base runner will not produce movement of the second

plate in the grooves and thrust produced by a first baseman's foot will be resisted by the stop flange.

4,398,715

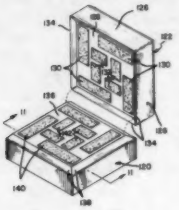
BREAKAWAY SAFETY BASE

Roger E. Hall, 100 Lakeview Homes, Elizabethtown, Pa. 17022

Continuation of Ser. No. 234,618, Feb. 17, 1981, abandoned, which is a division of Ser. No. 18,844, Mar. 8, 1979, Pat. No. 4,266,768, which is a continuation-in-part of Ser. No. 758,638, Jan. 12, 1977, abandoned. This application Jul. 6, 1982, Ser. No. 395,279

Int. Cl.³ A63B *71/02*

U.S. Cl. 273—25 **17 Claims**



1. A base assembly comprising:

(a) a base member having a lower mounting surface with beveled edges extending out and downwardly, and

(b) a resilient and laterally deformable upper element secured to said lower mounting surface and including a first engagement surface,

(c) a lower ground support having an upper mounting surface with downwardly beveled edges, and

(d) a resilient and laterally deformable lower element secured to said upper mounting surface and including an engagement surface, and

wherein said base member is secured to said lower ground support with the engagement surface of said upper element engaged to said engagement surface of said lower element and with said beveled edges of said base member resting on said beveled edges of said lower ground support, said base member being held to said lower ground support when said base member is subject to low non-injury potential lateral force, but the engagement being severable when said base member is subject to high injury potential lateral force, said beveled edges of said base cooperating with said beveled edges of said lower ground support to enhance vertical separation between said upper element and said lower element when said base is subject to lateral force.

4,398,716

HANDLER FOR TENNIS AND SIMILAR PLAY BALLS

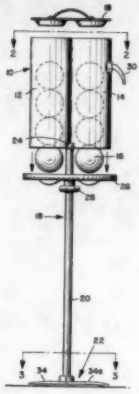
John Argibay, Jr., 944 Springhaven Rd., Springfield, Pa. 19064, and Jan A. Krejcar, 525 Maplewood Ave., Springfield, Pa. 19064

Filed Sep. 17, 1981, Ser. No. 303,086

Int. Cl.³ A63B *61/00*

U.S. Cl. 273—29 A **4 Claims**

1. An apparatus for carrying, retrieving and dispensing play balls comprising at least one elongated container for receiving and dispensing one or more play balls, said at least one container being open at each end, one of said ends being a ball receiving end and the other end being a ball discharge end, said ball receiving end having a plurality of elastic protrusions which are sufficiently deformable to permit entry and retention of play balls in said at least one container, a ball being retained when said container is inverted, said ball receiving end is placed over a ball and said container is lowered to cause a ball to be forced past said protrusions for retrieving balls from the playing surface, an elongated vertically extending support member having said at least one container attached to its upper end and a base member attached to its lower end, a tray supported on said support member intermediated said upper and lower ends and closely adjacent said discharge end for receiving balls from said container, said balls being gravitationally discharged through said discharge end when said apparatus is returned to an upright position and supported on said base member.



4,398,717

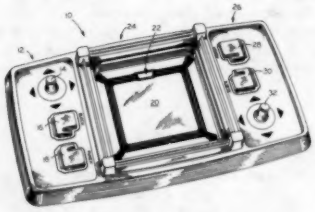
ELECTRONIC BOXING GAME

Jon P. Rosenfeld, 32 Oakland Ave., and Alfred C. Mecklenburg, 11 Coolidge Rd., both of Arlington, Mass. 02174

Filed Jul. 16, 1981, Ser. No. 284,124

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—85 G **26 Claims**



1. A self-contained electronic device for simulating a boxing match or the like to be played within a specified time period comprising:

a. a housing;

b. a display panel on said housing providing a visual simulation of a boxing ring and operable by application of electrical signals thereto to display a pair of opposing boxer symbols, each of said boxer symbols including a body portion, and to display at least one arm symbol for each of said boxer symbols and extending from said body portions thereof, said display of arm symbols being in both punching and blocking modes, said display panel being operable by application of electrical signals thereto to simulate knockdowns and knockouts of a simulated boxer symbol;

c. status-information means in said housing and operable by application of electrical signals thereto to display status information;

d. operational circuit means in said housing and electrically connected to said display panel for application of electrical signals thereto, said operational circuit means being

operable to transmit electrical signals to said display panel to display said body portions of said boxer symbols, to move them about said simulated ring, and to display said arm symbols extending from said body portions of each of said boxer symbols in said punching mode and from at least one of said body portions in said blocking mode, said operational circuit means detecting a simulated hit on the body portion of one boxer symbol by the arm symbol of another boxer symbol during a simulated punch to detect a simulated hit and transmit signals to said display panel to present an indication of the simulated hit, said operational circuit means detecting the simulated interruption of a punching arm symbol from a boxer symbol by a blocking arm symbol from another boxer symbol to prevent display of a simulated hit, said operational circuit means includes knockdown and knockout signal generating means transmitting electrical signals to said display panel for simulation of a knockdown and of a knockout of a boxer symbol, said operational circuit means including knockdown determining means operable only if a predetermined number of hits have been scored on a simulated boxer symbol within a predetermined time duration distinct from said specified time period to effect transmission of said electrical signals to said display panel for simulation of a knockdown, said operational circuit means additionally including knockout determining means operable to cause transmission of electrical signals to said display panel for simulation of a knockout of that boxer symbol, said operational circuit means also being electrically connected to said status-information means for transmission of signals thereto, said operational circuit means monitoring the simulated action to record information concerning the status of the simulated match and to transmit signals to said status-information means to display said status information;

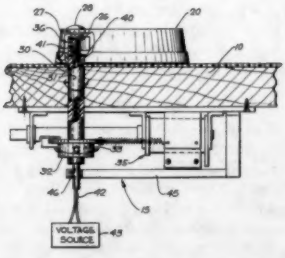
e. manually operable control elements electrically connected to said operational circuit means for transmission of electrical signals thereto upon manual operation of said manually operable control elements by a player of the game to operate said operational circuit means to move at least one of said boxer symbols about said simulated ring under manual control of the player, to display an arm of said last-mentioned boxer symbol in said punching mode under manual control of the player, and to display an arm of said last-mentioned boxer symbol in said blocking mode under manual control of the player, the player thereby being able to move a boxer symbol about said simulated ring under manual control to selectively cause simulated punches and blocks by the controlled boxer symbol.

4,398,718

ILLUMINATED FLIPPER ASSEMBLY

Max Wiczer, Skokie, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Jun. 25, 1981, Ser. No. 277,189
Int. Cl.³ A63B 67/08
U.S. Cl. 273—129 V **7 Claims**



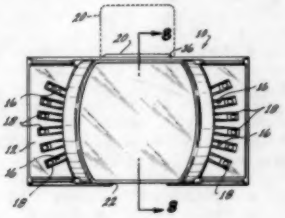
1. An illuminated flipper assembly for a pinball game having a playfield board, a pivoting mechanism and a source of voltage, said assembly comprising: a transparent flipper, a flipper shaft carrying said flipper and coupled to the flipper pivoting mechanism for rotation thereby with respect to the playfield board, said flipper shaft having a bore extending therethrough, a light shaft loosely extending through the bore in said flipper shaft and nonrotatably carried by the playfield board, said light shaft having a bore extending therethrough, a bulb carried by said light shaft, and wires extending through the bore in said light shaft for attachment to the source of voltage.

4,398,719

RANDOM ACTION TOY

Toru Nishimiya, Tokyo, Japan, and Toshiaki Kurita, Torrance, Calif., assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 246,004
Claims priority, application Japan, Mar. 21, 1980, 55-37853[U]
Int. Cl.³ A63F 9/00
U.S. Cl. 273—138 R **10 Claims**



1. A toy which comprises:

a housing;

an indicator means movably mounted on said housing to move between an indicating position and a non-indicating position;

an indicator moving means operatively associated with said indicator means and capable of moving said indicator means from said non-indicating position to said indicating position;

a control means mounted on said housing and operatively associated with said indicator means, said control means capable of reversibly maintaining said indicator means in said non-indicating position, at least a portion of said control means movable on said housing about a center of rotation between a plurality of discrete positions, said indicator means capable of being reversibly maintained in said non-indicating position by said control means independent of which of said discrete positions said movable portion of said control means is located in;

a plurality of individual operator means mounted on said housing, each of said plurality of said operator means independently movable by the operator movable by the operator of the toy radially towards and away from said center of rotation between a first position and a second position and for each of said discrete positions of said movable portion of said control means at least one of said individual operator means being operatively connected to said control means so as when said individual operator means which is operatively connected to said control means is moved from said first position to said second position said indicator means moves from a non-indicating position to said indicating position.

4,398,720

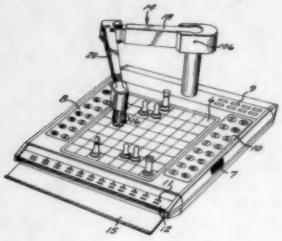
ROBOT COMPUTER CHESS GAME

Lawrence T. Jones, Playa del Rey; Ashley Howden; Mark S. Knighton, both of Los Angeles; Anson Sims, Granada Hills; David L. Kittinger, Van Nuys, and Richard E. Hollander, Santa Monica, all of Calif., assignors to California R & D Center, Culver City, Calif.

Filed Jan. 5, 1981, Ser. No. 222,436

Int. Cl.³ A63F *3/02*

U.S. Cl. 273—238 **21 Claims**



1. In a computer controlled chess game having a housing member, a chess board, chess pieces, a computer processing circuit, a memory unit, a robot arm movably mounted adjacent the chess board, and means on the robot arm for grasping and releasing a chess piece, the improvement comprising:

a multiple layer switch member positioned beneath each chess square to indicate the presence or absence of a chess piece;

a magnetic member for each chess piece;

a plurality of cavities beneath said multiple layer switch member and the chess board corresponding to each chess square and having a magnetic member movably contained therein, the cross-sectional area of said cavity configured to at least conform to the cross-sectional area of said magnetic member of the chess piece wherein placement of said chess piece actuates said switch member and spatially positions said chess piece at a predetermined location on each chess square to ensure alignment for coaction with the grasping and releasing means.

13. In a computer controlled chess game having a housing member, a chess board, chess pieces, a computer processing circuit, a memory unit, a robot arm movably mounted adjacent the chess board, means for grasping and releasing a chess piece, and means for determining the current position of the robot arm, a keyboard for inputing signals to the computer processing circuit including the desired level of skill to be implemented in searching the memory unit during a chess game, the improvement comprising:

an indexed portion of the housing member surface divided into discrete segments representative of incremental skill levels;

means for driving the robot arm from its current position to a start position above the indexed discrete segments;

means for driving the robot arm to scan sequentially each discrete segment;

means for lowering and raising the robot arm towards and from a discrete segment; and

means for activating the desired skill level indicated by the robot arm.

4,398,721

NUTRITION EDUCATION GAME

Ruth B. McKay, 101 East Melbourne Ave., Silver Spring, Md. 20901

Filed Aug. 31, 1981, Ser. No. 298,116

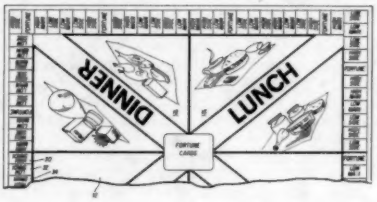
Int. Cl.³ A63F *3/00*; G09B *19/00*

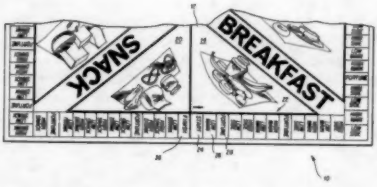
U.S. Cl. 273—249 **7 Claims**

1. In a board game apparatus for a nutrition education game to be played by a plurality of players and having a plurality of playing pieces, one for each player, and a playing board having a plurality of defined sequential spaces constituting a playing path about the outer margin of said board, to be traversed by said pieces during the playing of the game, the improvement comprising:

means associated with a majority of said sequential spaces identifying each respectively with a serving amount of an edible item having some particular content of a specific nutrient that is preferably present in the human diet in a limited amount or not at all, and that is selected from the group consisting of salt, sugar, absorbable cholesterol, and saturated fat, such identified spaces being referred to hereafter as nutritionally-identified spaces, at least some individual spaces of said nutritionally-identified spaces being associated with servings of different edible items having different content amounts of said specific nutrient than others,

chance-determining means for indicating a number of said sequential spaces in said playing path to be traversed by that player's playing piece in one turn, and





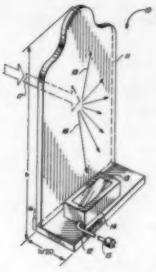
wherein said playing path is divided into sections corresponding to different eating times, respectively, said means associated with said nutritionally-identified spaces comprises a legend on each space identifying a class of food items, and a plurality of sets of cards, there being one set of cards for each said class and for several food items in each class, the cards in each said set of cards identifying respectively individual food items in that class and reporting their respective content values for said specific nutrient,

whereby each player completing a traversal of said playing path with the player's playing piece has the opportunity to have the piece stop in said path sections on a plurality of nutritionally-identified spaces representing respectively a plurality of different edible items each having different content amounts of said specific nutrient, and draw a card from the stack of cards corresponding to said class, the respective totals of the content amounts accumulated from the drawn cards for each of the several players being compared to select as the winner the player with the lowest total accumulated amount of said specific nutrient.

4,398,722
LASER BEAM TARGET

James F. Morris, Apopka, and Roland Pittman, Casselberry, both of Fla., assignors to International Laser Systems, Inc., Orlando, Fla.

Filed Mar. 22, 1982, Ser. No. 360,479
Int. Cl.³ F41J 5/02
U.S. Cl. 273—310 15 Claims

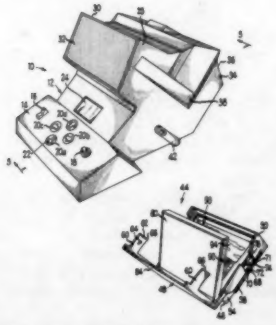


1. A target device comprising in combination:
a target formed of a material translucent to a laser wavelength; and
radiation detector means positioned behind said target on one end portion thereof and facing in a generally parallel direction to said target, whereby scattered radiation from a laser beam penetrating said target will be received by said radiation detector means to indicate a laser beam hitting said target.

4,398,723
VIEWING DEVICE FOR GENERATING A THREE-DIMENSIONAL IMAGE

Erick E. Erickson; Christian H. Oberth, both of Chicago; Jeffrey D. Breslow, Highland Park, and Douglas P. Montague, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 29, 1981, Ser. No. 229,659
Int. Cl.³ A63F 9/02
U.S. Cl. 273—313 24 Claims

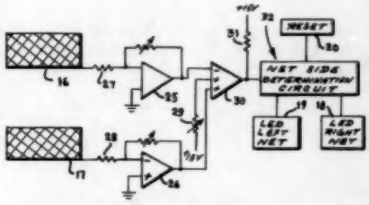


1. A viewing device comprising:
a housing;
a cartridge removably positionable within said housing, said cartridge including means for creating a three-dimensional image within said housing, said housing including means for viewing said image, said cartridge further including a hinged cover, said housing including means for opening and automatically rotating said cover from a closed to an open position upon insertion of said cartridge;
a light projection means mounted within said housing for selectively superimposing one of a plurality of playing symbols onto said image, said projection means including an array of light emitting elements and a manually actuable means for selectively controlling the operation of said light emitting elements; and
a light transmitting mirrored surface, rotatably attached to said cartridge and positionable within said housing to reflect at least some of the light from one of said light emitting elements into a viewer's line of sight so that said light appears to be positioned on said image.

4,398,724
VOLLEYBALL NET TOUCH DETECTING AND INDICATING SYSTEM

Wayne D. Wilson, 4934 Turquoise Cir., Colorado Springs, Colo. 80917, and James J. Joyce, 7630 Topin Rd., Colorado Springs, Colo. 80908

Filed Feb. 19, 1982, Ser. No. 350,500
Int. Cl.³ A63B 71/06, 61/00
U.S. Cl. 273—411 8 Claims



1. In combination with a volleyball court having a playing surface defined by sideline and endline bounds and a net positioned at center court, a volleyball net touch detecting and indicating system comprising
a source of radiant energy,
a first antenna means affixed to and substantially coextensive with one side of said net receiving said radiant energy,
a second antenna means affixed to and substantially coextensive with the opposite side of said net receiving said radiant energy;
means for amplifying the output of said first antenna means,
means for amplifying the output of said second antenna means,
comparator means receiving the amplified outputs of said first and second antenna means and outputting signals responsive to player net touch events,
a first indicator means for designating player touch events of said first antenna means,
a second indicating means for designating player touch events of said second antenna means, and
a net side determination circuit receiving the outputs of said comparator means and enabling said first indicating means in response to a net touch of said first antenna means and said second indicating means in response to a net touch of said second antenna means.

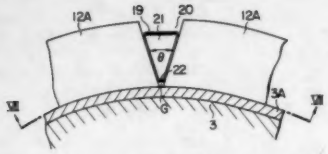
4,398,725
ROTARY SHAFT WATER SEAL DEVICE IN HYDRAULIC MACHINE

Muneo Maegawa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,627
Int. Cl.³ F16J 15/26
U.S. Cl. 277—192 2 Claims

1. A rotary shaft water seal device in a hydraulic machine,

wherein a solid packing in which a plurality of circular arcuate segments are annularly arranged such that adjacent segments are spaced apart from each other through a slight gap is received in a packing box provided on the outer periphery of a rotary shaft with the inner peripheral surface of said packing being brought into sliding contact with the outer peripheral



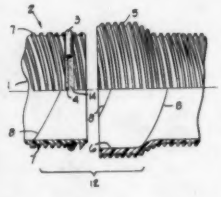
surface of said rotary shaft and guide members to guide the segments to be displaced in the radial direction of the axis of the segments are provided on the packing box, respectively, characterized in that each of said guide members is disposed in a space formed between the adjacent segments and outside said gap, being solidly secured to the packing box.

4,398,726

PIPE SECTION INCLUDING A GASKETED SPIGOT END AND METHOD OF MAKING THE SAME

Robert W. Heisler, Littleton, Colo., assignor to J-M Manufacturing Company Inc., Stockton, Calif.

Filed Jul. 6, 1981, Ser. No. 280,665
Int. Cl.³ F16J 15/10; F16L 21/02
U.S. Cl. 277—1 **10 Claims**



1. A pipe section comprising a spigot end including a sealing gasket positioned on said spigot end, said sealing gasket positioned in an annular groove in the outer surface of said spigot end approximate the end surface of said spigot end, a bedding material sealingly engaging and adhered to at least the radially innermost annular surface of said annular groove, means embedded in said bedding material for providing circumferential reinforcement to said pipe section at said annular groove, said sealing gasket adhered to said groove by said bedding material, said sealing gasket extending radially outward from said groove, said means for providing circumferential reinforcement comprises an elongated, flexible, porous, longitudinally inextensile member positioned circumferentially around said spigot end in said groove, said circumferential reinforcement being impregnated by and substantially encapsulated in said bedding material.

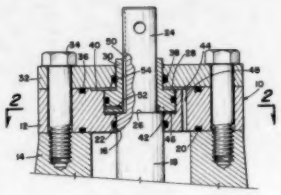
4,398,727

PRESSURE BALANCING STUFFING GLAND FOR SHAFTS

Nicholas M. Rylander, 228 W. 17th Pl., Tulsa, Okla. 74119

Filed Sep. 30, 1982, Ser. No. 429,051
Int. Cl.³ F16J 15/46; F16C 19/10, 39/04
U.S. Cl. 277—3 **6 Claims**

1. A stuffing gland for a shaft subjected to relatively high pressures and comprising first plate means secured around the outer periphery of the shaft and having a central bore provided therein surrounding the shaft, outwardly extending circumferential flange means provided around the outer periphery of the shaft and disposed in the central bore, second plate means secured adjacent the outer surface of the first plate means for retaining the flange means in said central bore, pressure chamber means provided between the second plate means and one side of said flange means, means provided for relieving pressure at the opposite side of said flange means, passageway means extending through the first plate means for communication said relatively high pressures to the pressure chamber means, and the area of the flange means exposed to the pressure in the pressure chamber means being equal to the cross sectional area of the shaft for balancing the forces acting on the shaft.

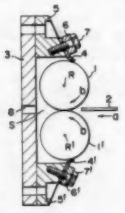


4,398,728

PRESSURE SEAL STRUCTURE AND PRESSURE SEALED TRANSFER MECHANISM

Hiromu Sukegawa, Hitachioota, and Yoshiaki Tomisawa, Hitachi, both of Japan, assignors to Hitachi Chemical Company, Limited, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 270,101
Claims priority, application Japan, Jun. 10, 1980, 55-78659
Int. Cl.³ F16J 15/32, 15/46
U.S. Cl. 277—12 **7 Claims**



1. A pressure sealed transfer mechanism for transferring a sheet between an outside space of said transfer mechanism containing a fluid at a higher pressure and an inside space of said transfer mechanism containing a fluid at a lower pressure, comprising;

two rollers, whose central rotational axes extend generally parallel to one another, and which are in sealing contact along a line which is a generatrix of both of them; and

two sealing structures, one corresponding to each one of said rollers, each said seal structure comprising:

a fixed member which extends generally parallel to said one roller; and

a flexible seal member, extending generally parallel to said one roller and said fixed member, formed with two opposite edges also extending generally parallel to said one roller and said fixed member, one of said two edges being sealing fixed to said fixed member, and the other of said two edges lying against and sealingly contacting said one roller generally along a generatrix thereof, a free part of said flexible seal member between said two edges thereof

being generally bent so that said outside space is defined on the generally concave sides of said flexible seal members and said inside space is defined on the generally convex sides of said flexible seal members;

whereby the higher fluid pressure present in said outside spaces presses said contact edges of said flexible seal members firmly against said rollers.

4,398,729

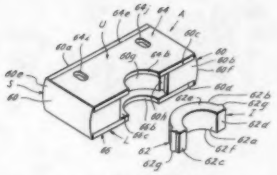
BLOWOUT PREVENTER INNER RAM SEAL ASSEMBLY

Thomas R. Bishop, and Archie W. Peil, both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Dec. 20, 1982, Ser. No. 450,999

Int. Cl.³ F16J *15/56*; E21B *33/06*

U.S. Cl. 277—73 **13 Claims**



1. An inner seal assembly adapted to be mounted with a ram of a blowout preventer, comprising:

a central sealing member for mounting with the ram of the blowout preventer, said central sealing member having a sealing face and a ram face, said sealing face and said ram face being substantially parallel to one another, said sealing face formed having an insert detent formed therewith, said insert detent formed in said central sealing member extending from said sealing face towards said ram face;

a seal insert having a perimeter formed of an inner sealing surface area, an outer surface area, and a seal face area;

said outer surface area of said seal insert formed having at least one outwardly projecting securing member;

said insert detent having at least one securing member receptacle formed therewith for receiving said securing member of said seal insert;

said seal insert being removably mounted with said central sealing member by yieldable cooperation between said seal insert and said central sealing member; and

said outer surface area of said seal insert engaging said insert detent of said central sealing member and said securing member being received in said securing member receptacle, with said seal face area of said seal insert in alignment with said sealing face of said central sealing member.

4,398,730

ROTARY RING SEAL WITH GAS-DYNAMIC LUBRICATION FOR HIGH-SPEED TURBOMACHINES

Gerhard Rücker, Karlsfeld; Wilfried Weidmann, Munich, and Karl-Ullrich Reisenweber, Unterschleissheim, all of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

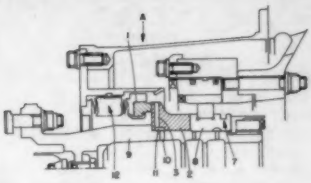
Filed May 7, 1982, Ser. No. 376,228

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119467

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—96.1 **6 Claims**

1. In a rotary seal with gas-dynamic lubrication for high-speed turbomachines, particularly gas turbine engines, including two cooperating rings, one of said cooperating rings being a mating ring radially perforated with bore holes extending in parallel with the ring sealing face and supplied with a cooling liquid, the improvement comprising in that a circumferentially periodically uniformly increasing and decreasing number of said bore holes in said mating ring generate a periodically alternating temperature and an axial expansion zone on the ring so as to produce a periodically uniformly undulated sliding



surface on the mating ring which conforms with the lubricant wedge profile of a gas-dynamic bearing.

4,398,731

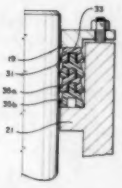
Y-INTERLOCK PACKING SEAL

Gerald W. Gorman, Duncanville, Tex., and Hal W. Gorman, Rte. 2, Box 320, Midlothian, Tex. 76065, assignors to Hal W. Gorman, Midlothian, Tex.

Filed May 7, 1982, Ser. No. 375,801

Int. Cl.³ F16J *15/22*

U.S. Cl. 277—124 **7 Claims**



1. A seal sealingly engaged intermediate a cylindrically shaped rod and surrounding tubular, cylinder-shaped wall and including:

a. a gland ring for retaining a top of said seal in place longitudinally: and

b. means for supplying mechanical pressure to said seal, including a bottom ring: the improvement comprising:

c. a top ring of packing seal consisting essentially of an extruded lineal member of elastomeric material having in cross-section a height h from top to bottom, a width ΔR, a pair of heels that slope outwardly from said top to form a substantially flat bottom, said bottom having a groove disposed intermediate said heels and adapted to receive a linear anti-roll tab from a contiguous ring therebeneath; said lineal member having a substantially flat top contiguous said gland ring and having ends joined adjacent each other in a joint; said top ring serving both to block flow of fluid and to adapt a seal cavity to accommodate additional rings; and

d. at least one additional ring of packing seal consisting essentially of an extruded lineal member of the elastomeric material having in cross-section height h from top to bottom, a width ΔR, a pair of heels that slope outwardly from said sidewalls of said top to form substantially flat bottom, said bottom having a groove disposed intermediate said heels and adapted to receive a linear anti-roll tab from the contiguous ring therebeneath: said linear member having a substantially flat top for being contiguous said bottom of said contiguous ring at its top and having a linear anti-roll tab disposed on its top and placed laterally so as to matingly engage said groove on said bottom of said contiguous ring; the rings engaging tops to bottoms and tops of anti-roll tabs to bottoms of engaging grooves so as to form substantially cylindrical annular spaces radially interiorly and exteriorly of said anti-roll tab and within said grooves; said flat bottom of the bottom ring

engaging said means for applying mechanical pressure; each said ring having its respective ends joined adjacent each other in respective joints.

4,398,732

SEALING RING

Jorn Christensen, Horsens, Denmark, assignor to Schionning & Arve' A/S, Horsens, Denmark

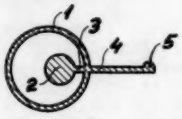
PCT No. PCT/DK81/00053, § 371 Date Dec. 2, 1981, § 102(e) Date Dec. 2, 1981, PCT Pub. No. WO81/03214, PCT Pub. Date Nov. 12, 1981

PCT Filed May 8, 1981, Ser. No. 329,278

Claims priority, application Denmark, May 9, 1980, 2023/80

Int. Cl.³ F16J *15/00*; F16L *21/08*

U.S. Cl. 277—207 A **4 Claims**



1. A sealing ring of an elastic material, intended to be applied to the spigot end of a pipe under expansion of the ring diameter and subsequent insertion into a pipe socket of an adjoining pipe, said sealing ring consisting of a ring-shaped hose in whose cavity there is provided a solid compression member which is connected to the hose, characterized in that the compression member is connected to the hose through a flap which is short in cross-section so that the compression member is disposed as excentrically as possible with respect to the hose which has a thin collapsible wall, said flap having an elongation that extends beyond the hose.

4,398,733

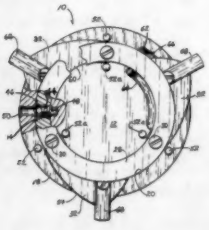
JAWED, LATHE CHUCK

Thomas C. Mosley, Jr., 8628 E. Granada Rd., Scottsdale, Ariz. 85257

Filed May 13, 1981, Ser. No. 263,130

Int. Cl.³ B23B *31/12, 31/40*

U.S. Cl. 279—1 TE **19 Claims**



1. A jawed, lathe chuck, comprising:

a hub;

a jaw carrier, having a plurality of equally-spaced apart jaws pivotably coupled thereto; and

a chuck body; wherein

said hub is journalled in said jaw carrier for accommodating relative rotation between said hub and said jaw carrier; and

said jaw carrier is journalled in said body for accommodating relative rotation between said jaw carrier and said body; and further including

means carried by said hub, and engageable with said jaws, for causing said jaws to pivot, upon said hub and jaw carrier executing relative rotation therebetween;

means carried by said body, and engageable with said jaws, for causing said jaws to pivot, upon said jaw carrier and said body executing relative rotation therebetween; and

means mounted in said jaw carrier, and engageable with said hub and said body, selectively operative in a first mode for prohibiting relative rotation between said hub and said jaw carrier, and selectively operative in a second mode for prohibiting relative rotation between said jaw carrier and said body.

4,398,734

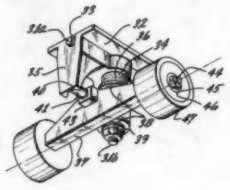
TRUCK DESIGN FOR A SKATE-TYPE DEVICE

Robert G. Barnard, 312 University Ave., Apt. #8, Davis, Calif. 95616

Filed Jan. 5, 1981, Ser. No. 222,621

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.28 **13 Claims**



1. In a skate, such as a skate board or roller skate, a wheel supporting truck assembly comprising:

a base member for mounting to said skate;

a tilt axle rotatably mounted to said base and oriented generally parallel to the plane of said skate;

a steering axle connected generally at a right angle to said tilt axle;

a yoke assembly mounted for rotation about said steering axle, said yoke including a wheel axis and a pair of wheels rotatable about said axis;

means yieldably urging said steering axle into normally perpendicular relationship with respect to said base member;

a leg depending downwardly from said base member, and leg engaging means associated with said yoke and engaging said leg at a location displaced from the axis of rotation of said tilt axle such that rotation of said base member about said tilt axle causes said leg member to be displaced laterally in an arc, thereby turning said yoke about said steering axle in a plane generally perpendicular to the arc of said leg.

4,398,735

SOLID STATE SKATE TRUCK

Brian L. Evans, Laguna Hills, Calif., and Robert R. Woodcock, Carson City, Nev., assignors to D. Beam, Newport Beach, Calif.

Continuation of Ser. No. 177,389, Aug. 12, 1980, abandoned, which is a continuation of Ser. No. 10,525, Feb. 9, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,371

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.28 **12 Claims**

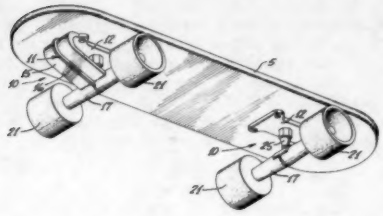
1. A skate truck comprising: an elongated beam of flexible material having a width substantially greater than the thickness thereof, said beam including:

(a) a first unitary member extending in a plane generally parallel to the bottom of a skate to which it is adapted to be attached;

(b) a second unitary member formed with one end integral with the first member and the plane of the second member extending at an acute angle to the plane of the first member, the second member having at its other end an axle or axle hub connected thereto; and

(c) the second member including an elongated section ex-

tending along the longitudinal axis of the second member, centrally thereof, and normal to the axis of the axle or axle hub, the elongated section lying in a plane at right angles



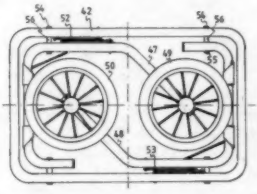
to the plane of the second member thereby providing resistance to vertical deflection and a twisting axis to the second member.

4,398,736

CART, UNDERCARRIAGE WITH FOLDABLE WHEELS

Jacques A. De Wijn, W. Alexanderdreef 28, Hoevelaken, Netherlands

Filed Nov. 18, 1980, Ser. No. 208,018
Int. Cl.³ B62B *1/12, 3/02*
U.S. Cl. 280—40 **3 Claims**



1. A cart undercarriage comprising:

a rectangular tubular frame having two side members and two end members and defining a plane;

two supporting members, each having an upper U-shaped section and an angled lower section, each U-shaped section having a base portion and two legs, each leg of each U-shaped section being pivotally attached to one of said end members, said base portion extending above said plane when said supporting members are in an unfolded position, each lower section being fixed to an end of one of said legs and extending below said plane;

two axles, each axle being attached to a lower end of one of said angled lower sections;

two wheels, each wheel being rotatably mounted on one of said axles; and

two locking devices, each locking device being interconnected between one or said end members and one of said supporting members to lock said one of said supporting members in said unfolded position, said supporting members being entirely in said plane in a folded position.

4,398,737

TRANSPORT DEVICE FOR WHEELLESS POWER DRIVEN EQUIPMENT

Edward M. Harding, Middletown, Md., assignor to Equipment Development Company, Frederick, Md.

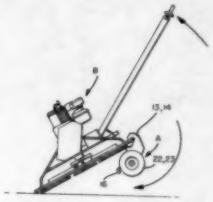
Filed Jan. 13, 1981, Ser. No. 224,809
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—47.13 R **4 Claims**

1. A portable hybrid roller skate device for use in transporting a relatively large and heavy surface treating machine having a base rim across a surface, said device comprising:

a body;

pivot hook means integral with said body for hooking over and pivoting about the base rim of said surface treating machine;

said roller skate device having a centroid located so that when the base rim of said surface treating machine nearest said pivot hook means is lifted from a resting position on



said surface, said roller skate pivots about said base rim and swings under said surface treating machine to remain under said machine when said machine is returned to a resting position to support at least a portion of said machine; and

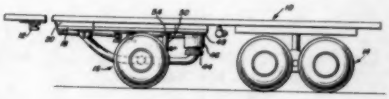
roller means mounted on said body for contacting said surface when said roller skate device supports said machine, said roller means allowing the device to be easily transported.

4,398,738

SELF-STEERING AND RETRACTABLE AXLE ASSEMBLY

Thomas I. McDaniel, Rte. 1, Box 289C, Aztec, N. Mex. 87410

Filed Mar. 26, 1981, Ser. No. 247,741
Int. Cl.³ B62D *53/08, 21/00*
U.S. Cl. 280—81 R **9 Claims**

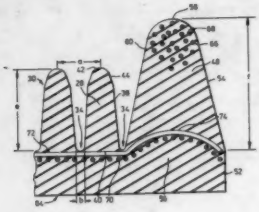


1. In combination with a semi-trailer of the type including a front portion for universal coupling to and support from a towing vehicle and a rear portion having wheeled running gear supported therefrom, supplemental wheeled running gear supported from an intermediate portion of said trailer disposed between said front and and rear portions, said supplemental wheeled running gear including a downwardly facing bearing plate stationarily mounted on said intermediate portion, a mounting plate supported from said bearing plate beneath the latter for free oscillation relative thereto about an upstanding axis and shifting of said mounting plate relative to said bearing plate along a predetermined path generally normal to said axis between first and second limit positions, said mounting plate having wheeled running gear supported therefrom including opposite side wheels journaled about horizontal axes extending substantially normal to said path, said axis being disposed on opposite sides of a vertical plane containing said axes when said mounting plate is in said first and second limit positions, and means operably connected between said mounting plate and said bearing plate operative to selectively shift said mounting plate between said first and second limit positions.

4,398,739
SPLASH GUARD

Ross A. McKenzie, Toronto, and Hans Busch, Mississauga, both of Canada, assignors to National Rubber Company, Limited, Toronto, Canada

Filed Nov. 10, 1980, Ser. No. 205,290
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—154.5 R **11 Claims**



1. A splash guard to be suspended adjacent a vehicle wheel to reduce splash of liquid and slush therefrom, comprising:

a sheet of flexible material having a splash receiving surface covered with spaced apart, discrete, elongated, stiff nipple-like protuberances arranged in downwardly extending rows to define downwardly extending flow paths between them along the sheet and open at their lower ends;

downwardly extending stiffening ribs protruding from the surface adjacent opposite edges thereof, the protuberances and ribs being integral with the sheet and directing the liquid and slush into the downwardly extending flow paths to drain from the sheet, the flow paths being about 1/100 to ¾ inch wide, the protuberances about ¼ to 1 inch high and the ribs about ½ to 1¼ inch high and higher than the protuberances;

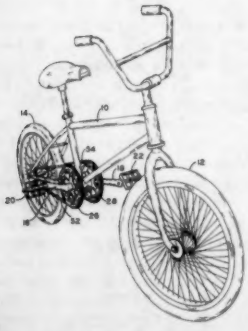
first reinforcement means in the form of a plurality of threads embedded within the sheet adjacent the splash receiving surface to resist excessive convex flexing of the sheet; and

second reinforcement means in the form of a plurality of downwardly extending threads embedded within the ribs adjacent their free edges to resist excessive convex flexing of the ribs and the surface.

4,398,740
CHAIN DRIVE FOR A BICYCLE

Victor L. Clem, 5316 Stellhorn Rd., Fort Wayne, Ind. 46815

Filed Dec. 7, 1981, Ser. No. 328,124
Int. Cl.³ B62M *9/02*
U.S. Cl. 280—261 **7 Claims**



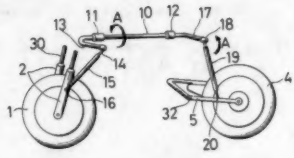
1. A double drive wheel hub assembly for a bicycle comprising a wheel hub having opposite end portions, two sprocket devices mounted on said opposite end portions, respectively, for imparting rotation in a common direction to said hub, said sprocket devices being free wheeling relative to said hub when the latter is rotating in one direction but are drivingly engageable therewith when rotated in the same direction at a rate faster than said hub,

said two sprocket devices being commonly threadedly coaxially secured to said hub end portions, respectively, means threaded oppositely on one of said end portions for further retaining the adjacent sprocket device on the same end portion, the threading of said means and the other sprocket device being in a tightening direction when said sprocket device is rotated at said faster rate.

4,398,741
ANTI-NOSE-DIVE APPARATUS OF A MOTORCYCLE

Kinuo Hiramatsu, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 22, 1981, Ser. No. 333,485
Claims priority, application Japan, Dec. 22, 1980, 55-182633
Int. Cl.³ B60G *21/04*
U.S. Cl. 280—283 **9 Claims**

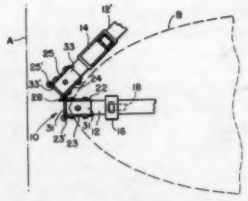


6. A motorcycle including anti-nose-dive apparatus, comprising a frame, front and rear wheels, front and rear mounting means connecting said front and rear wheels to said frame, a generally U-shaped torsion bar including a center portion and front and rear arm portions, said center portion extending lengthwise of said frame and rotatably attached to said frame, first means connecting said front arm to said front mounting means, and second means connecting said rear arm to said rear mounting means.

4,398,742
HINGED DRAWBAR FOR BOAT TRAILER

Robert W. Sanders, 72 Lynwood Dr., Brockport, N.Y. 14420

Filed Apr. 15, 1982, Ser. No. 368,883
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—491 B **10 Claims**



1. An improved trailer, comprising

a frame,

a trailer drawbar projecting from said frame and being cut intermediate its ends into two separate sections,

hinge means releasably securing the cut end of said one section of said drawbar to the cut end of the other section thereof, and operative to permit pivotal movement of said

other section selectively into and out of an operative position in which it registers axially with said one section to form an extension thereof, and

coupling means on the opposite end of said other section for releasably connecting the trailer to a towing vehicle, when said other section is in its operative position,

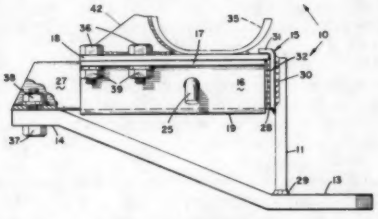
said hinge means comprising two separate hinge pins both of which can be removed completely to disconnect said other section from said one section of the drawbar, and one of which can be removed to permit said other section to be swung about the other hinge pin to an inoperative position in which said other section is folded rearwardly to a collapsed position in which said coupling means is positioned rearwardly of said opposite end of said one section.

4,398,743

VEHICLE TOWING SYSTEM

Jerome Belsky, 44 Strawberry La., Rolling Hills Estates, Calif. 90724, and D. Michel Belsky, 5427 Vista Fortuna, Cypress, Calif. 90630

Filed Feb. 8, 1982, Ser. No. 346,933
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—495 **11 Claims**



1. A vehicle towing system for use with towing vehicles having rear bumpers secured to the vehicle frame and with towed vehicles having a forward tang for coupling a ball hitch thereto, comprising:

(a) an anchor plate member secured to the underside of the rear bumper and extending therebeyond, the forwardmost end of the anchor plate member having a plurality of holes therein and a rearwardmost end which projects beyond the place of securement to the rear bumper;

(b) a bracket member having a longitudinally arranged channel therein having a pair of oppositely disposed holes in the sides of said channel with a pair of flanges extending laterally from the top edges of the channel, said flanges having holes therein alignable with the holes in the anchor plate member;

(c) fastener means for securing the bracket member to the anchor plate member via the aligned holes therethrough;

(d) a tongue member adapted for slideably mating with the channel in said bracket member, said tongue member having aperture means transversely disposed therethrough and alignable with the holes in the sides of said channel of said bracket member so that when the forwardmost end of said tongue member is inserted into the channel said holes may be aligned;

(e) locking means insertable through the aligned holes in said sidewalls of said channel and said tongue member for locking the tongue member relative to the bracket member;

(f) an end plate member secured to the rearwardmost end of the tongue member, said end plate member having an inwardly directed lip means along the top edge thereof;

(g) a standoff member secured at one end to the end plate member and depending downwardly therefrom;

(h) a towing tang having a mounting hole therein for a ball hitch, said towing tang being secured to the bottommost end of said standoff member; and a

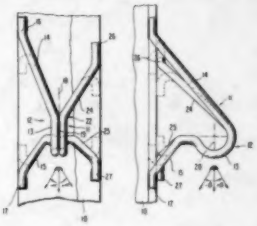
(i) load transfer strap secured between the forwardmost end of said tongue member and the end of said towing tang secured to the standoff member.

4,398,744

LOAD ROD FOR VEHICLES

Roman Schöppel, Sindelfingen; Wolfgang Fischer, Leinfelden, and Bernd Harloff, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Sutttgart, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,510
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1980, 3007897
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—504 **14 Claims**



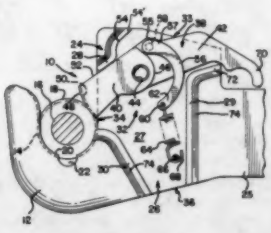
1. A load rod for vehicles, characterized in that the load rod comprises at least two individual shaped rod members, each of said rod members having a rod loop portion, and force distributing leg means diverging outwardly from said rod loop portion, mounting means are provided on each of the force distributing means for enabling a mounting of the load rod on a body portion of the vehicle, each of the individual rod members are in abutment with each other and joined to each other in an area of the respective rod loop portions along a predetermined connecting line, and in tht the force distributing leg means diverge in spider configuration outwardly from both sides of the predetermined connecting line.

4,398,745

THREE POINT HITCH LOWER LINK CLAW

Joseph A. Azzarello, Palos Heights, and Carlos T. San Luis, Villa Park, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 269,236
Int. Cl.³ B60D *1/04*
U.S. Cl. 280—508 **11 Claims**



8. A claw hitch for a three point linkage on a tractor and comprising:

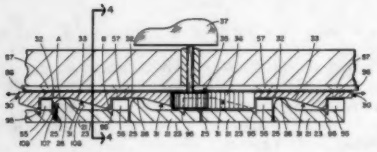
a coupling hook having a jaw adapted to receive an associated ball being unitary with an implement coupling rod;
a lock mechanism for self-locking of the ball in said jaw;
said hook comprising a lock mechanism housing;
said lock mechanism comprising a one-piece lever pivotally connected with said housing;
said lever having a handle end protruding through and outwardly of said housing and the latch end movable within and outwardly away from said housing;
said latch end comprising a convex camber portion with a groove lockingly engageable with the ball in a locked position and permitting said ball to limitedly rotate in any direction;
spring means connected with said housing and said lever for over center spring biasing of and forcing said lever to remain in both locked and unlocked positions by being placed in such a way so as to apply its force to opposite sides of said lever pivot axis; and
said housing including a stop bridge abutting said lever in the locked position and a bridge wall corner block abutting said lever in the unlocked position.

4,398,746

ADJUSTABLE WAXLESS SKI BASE

Gary R. Heintz, 4919 S. Eastlake Dr. #22G, Murray, Utah 84107

Filed Jan. 12, 1981, Ser. No. 224,276
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—604 **32 Claims**



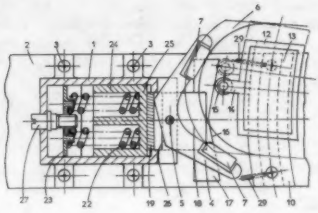
1. A waxless ski base capable of continuous adjustment from a flat-base glide configuration to a stepped-base grip configuration for increased traction and resistance to movement over a snow surface, comprising:
a. a elongated support member;
b. a plurality of base segments, each segment having a planar glide face, a contiguous gripping face in approximate vertical orientation with respect to said glide face and a displacement contact face opposite said glide face, said segments being coupled and aligned along a bottom face of the support member such that each glide face is oriented away from the bottom face of said support member and forms part of a flat base when in a glide configuration, said gripping face being oriented along a direction of desired resistance to facilitate a gripping contact with said snow surface when said segments are adjusted to the stepped-base grip configuration;
c. means for independent pivotal attachment of each base segment to said support member;
d. a segment adjustment member disposed between the support member and said aligned base segments, said adjustment member including a plurality of displacement faces which have differing programmed geometric configurations which respectively contact said segment displacement contact faces and mutually cooperate to displace said segments from the flat-base glide configuration to a nonlinear stepped configuration; and
e. means for selectively changing the location of contact of said segment contact faces along the respective programmed geometric configurations of the segment displacement faces.

4,398,747

TOE FITTING OF SAFETY SKI BINDING

Jean Bernard; Jean J. A. Beyl; Philippe Buzon, all of Nevers, and Daniel le Faou, Nievre, all of France, assignors to Ste Look, Nievre, France

Filed Dec. 11, 1980, Ser. No. 215,565
Claims priority, application France, Dec. 21, 1979, 79 31409
Int. Cl.³ A63C *9/085*
U.S. Cl. 280—630 **8 Claims**



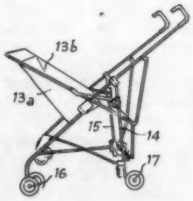
1. A toe fitting of a safety ski binding comprising:
a body for fixed securement to an elongated ski;
a ski boot retaining jaw supported by said body for pivotal movement about a pin perpendicular to the top surface of the ski and against movement transverse to the elongation of the ski;
resilient means in said body for exerting on said jaw a presettable force against pivotal movement of said jaw;
supporting means for a toe end portion of the ski boot and including a member movable with respect to both the ski and said jaw in response to transverse movement of the boot; and
means connecting said member and said resilient means to cause a decrease in the force exerted on said jaw by the resilient means as said member is moved in response to transverse movement of the boot.

4,398,748

INCLINABLE SUPPORT, PARTICULARLY FOR CHILD'S CARRIAGE

Maurice-Claude Duvignacq, Ciboure St. Jean de Luz, France, assignor to Baby Relax, Anglet, France

Filed Aug. 25, 1980, Ser. No. 180,921
Claims priority, application France, Oct. 2, 1979, 79 24532
Int. Cl.³ B62B *7/14*
U.S. Cl. 280—644 **12 Claims**



1. In an inclinable support particularly applicable to baby carriages, comprising a frame adapted to be folded into a bundle and by a body pivotally connected to said frame,
a. said frame comprising two substantially parallel, lateral carrier elements, defining, in unfolded position, an inclined frontal plane, each of the elements being composed of two parts articulated on each other and foldable on themselves, and
b. a structure for supporting said carrier elements, comprising, in known manner, folding and bracing elements artic-

ulated on one another and on the carrier elements, so as to form, in unfolded position, a base crosspiece and a rear crosspiece for maintaining said carrier elements in said frontal plane and comprising a transverse strut element for bracing the structure in its unfolded position,

c. said body comprising two longitudinal elements articulated respectively on the carrier elements and inside them, the articulation of each said longitudinal element on the frame dividing each said longitudinal element into two substantially unequal parts, including a short part, a supple sling-like seat element extending between and permanently connected to the two longitudinal elements, said sling-like seat element being reversible, and means for blocking the inclination of each of the longitudinal elements with respect to the frame,

the said longitudinal body elements being rotatable through about 180° about their articulation between a first "cradle" position of the body in which the longitudinal elements are substantially horizontal, their short part facing forwards, and a second "cradle" position of the body in which the longitudinal elements are substantially horizontal, their short part facing the rear, by a rotation of said short parts downwardly, the base and rear crosspieces being located outside the volume occupied by the short part of the body during its rotation about the said articulation.

4,398,749

DEVICE FOR ADJUSTABLY FASTENING A BELT FITTING TO AN AUTOMOBILE BODY

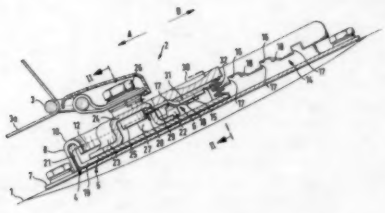
Karl H. Hipp, Munich, and Josef Märtz, Eching, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,513

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007986

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **15 Claims**



1. A mechanism for adjusting a fitting for the belt of a motor vehicle seat belt system with said fitting being fastened to the motor vehicle body, the fitting being vertically adjusted manually, comprising a guide, fastened to the vehicle body, for an adjusting member with an anchorage means for the fitting and a pressure-activated lock bolt which, by means of spring tension, engages automatically into tooth gaps, serving as stop points, of a locking tooth construction disposed at the guide, with said locking tooth construction having locking surfaces aligned substantially vertically to the sliding direction of the adjusting member in belt stress direction, characterized in that

the lock bolt is disposed separately and movably at the anchorage means of the fitting,

that the locking tooth construction has deflector slopes by means of which the lock bolt is automatically removed from the respective stop point when the adjusting member is adjusted in the opposite direction,

and that a push-button is provided for operating the lock bolt.

4,398,750

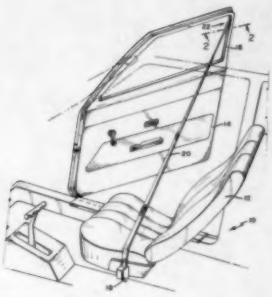
EMERGENCY RELEASE MECHANISM FOR PASSIVE SEAT BELT SYSTEMS

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 19, 1981, Ser. No. 313,006

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **10 Claims**



1. In a passive seat belt system including a seat belt adapted to automatically be positioned about an occupant in a seat in a vehicle, said seat being located adjacent to a door of said vehicle, said seat belt normally attached to said door, and an emergency release means for releasing said seat belt from said door to permit egress of the occupant from said vehicle in an emergency situation, the improvement comprising:

said emergency release means comprising:

a housing mounted on said door;

a retaining lever pivotally mounted in said housing and adapted to communicate with said seat belt, said lever being movable from a first position at which it retains said seat belt in its operative mode to permit automatic positioning about said occupant to a second position at which it releases said seat belt;

latch means in said housing located at a first position at which it holds said lever in its first position, said latch means being movable in said housing to a second position at which it no longer holds a lever in its first position;

means automatically moving said lever from its first position to its second position upon movement of said latch means to its second position; and

actuator means supported in said housing and in contact with said latch means, said actuator means being movable from a first lock position to a second release position, movement of said actuator means from its first to second positions resulting in movement of said latch means from its first to second positions, whereby said lever is moved to its second position to release said seat belt.

4,398,751

SHOULDER LEVEL LINK POINT FOR VEHICLE SAFETY BELT

Ernst Wahlmann, Meerbeck, and Willi Schottker, Nordsehl, both of Fed. Rep. of Germany, assignors to P.A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen, Stadthagen, Fed. Rep. of Germany

Filed May 6, 1981, Ser. No. 260,925

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018442

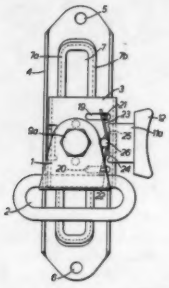
Int. Cl.³ B60R *21/10*

U.S. Cl. 280—808 **6 Claims**

1. A device for the adjustment of a link point of a safety belt arranged adjacent the shoulder of a vehicle occupant comprising,

a slide member having

an angled leg with a locking opening therein,
an adjustably lockable link point carried by the slide member,
a guide mounted within the interior of the vehicle, receiving the link point and having
a limb with a series of openings therein,
a slide piece movable in the guide and having a tapped bore therein,
a bolt screwed in the tapped bore which connects together the slide member and the slide piece,
a locking device to effect the adjustment and locking of the slide member,
a return spring biasing the locking device to the locked configuration,



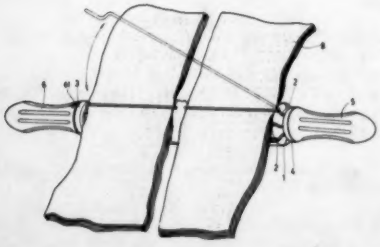
said locking device being movable substantially perpendicularly to the direction of the movement of the slide member and being connected with the latter, and engaging, in the locked configuration of the slide member in one lock opening of said series of openings, and
a link movable in the slide member and carrying the locking device which latter in the locked configuration also engages in the said lock opening in the angled leg of the slide member,
said angled leg of the slide member engaging over the limb of the guide and lying substantially parallel to the latter and
for the guidance of the locking device a respective guide surface is provided on the slide piece and a guide surface is provided on the link.

4,398,752

TYPE OF STRUCTURE FOR NEWSPAPER CLIP

Chaur-Chiang Hwang Lii, 3rd Floor, No. 1, Alley 49, Lane 82, Hwu Lin St., Taipei City, Taiwan

Filed Feb. 10, 1981, Ser. No. 233,121
Int. Cl.³ B42D *15/06, 17/00*
U.S. Cl. 281—47 **8 Claims**



1. A newspaper clip comprising:
a generally cylindrically shaped bar member having a central portion grooved with a plurality of longitudinal slots and first and second end portions at respective ends of said central portion each having a smaller diameter than said central portion;
a ring member having a central opening for engaging said first end portion and a plurality of holes about a circumferential portion thereof;
a plurality of iron wires each wire having a first retaining end and a second end for being passed through a respective hole in said ring member said first end forming a pivotal junction between said wire and said ring member;
a collar member having a central opening for engaging said second end portion of said bar member and having a notch in a circumferential portion thereof adapted to receive and retain said second end of each wire;
each iron wire being shaped such that when released at its second end from said collar member notch, it may pivot freely away from said bar and when retained within said notch it is held securely within its respective groove of said bar member, the wires being individually releasable from said collar notch permitting the insertion or removal of a newspaper intended to be held by any of said wires within its respective groove.

4,398,753

PRESSURE SENSITIVE RECORDING UNIT

Makoto Asano; Kiyoharu Hasegawa; Hiroyuki Akahori, all of Yokohama, and Michihiro Tsujimoto, Tachikawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,325
Claims priority, application Japan, Dec. 26, 1980, 55-183878; Oct. 30, 1981, 56-172787
Int. Cl.³ B41L *1/20*
U.S. Cl. 282—27.5 **12 Claims**

1. A pressure sensitive recording unit comprising a single base web sheet and a colorless or light-colored methine-type dyestuff represented by the formula (I):

(I)

wherein, X, Y and Z represent individually a phenyl, naphthyl, or β-styryl group or a residue of an aromatic heterocyclic ring which group or ring may optionally be substituted, X, Y and Z may be the same or different, and either two of X, Y and Z may be coupled together to form a ring, and an organic oxidizing compound selected from oxidizing quinone derivatives substituted by a multiplicity of electron attractive groups, both the dyestuff and the oxidizing compound being supported on the single base web sheet; or a combination of a first base web sheet on which said methine-type dyestuff is supported and a second base web sheet on which said organic oxidizing compound is supported.

4,398,754

ELECTRICALLY INSULATED PIPE COUPLING AND METHOD FOR MAKING THE SAME

Steven J. Caroleo, McKees Rocks, and Edward L. Schmitt, Pittsburgh, both of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Aug. 11, 1980, Ser. No. 177,236
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—45 **12 Claims**

1. An electrically insulated pipe coupling comprising,
a first coupling member and a second coupling member,
said first and second coupling members being positioned in axial alignment and including oppositely positioned end portions spaced from one another,

said oppositely positioned end portions each having an annular sealing surface,

an insulating sleeve having a bore therethrough for receiving and surrounding said coupling member end portions,

said first and second coupling member end portions being externally threaded and said insulating sleeve being internally threaded to receive and connect said first and second coupling members in spaced relation,

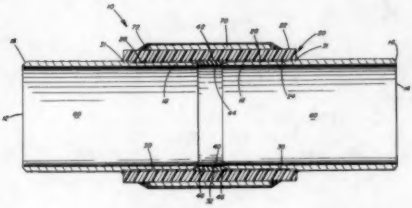
said insulating sleeve having opposite ends and an inner, annular recessed portion,

a resilient annular spacer retained in said insulating sleeve recessed portion between said coupling member end portions,

said annular spacer having an outer surface and an inner surface, said outer surface abutting said insulating sleeve,

said annular spacer including end portions overlapping said coupling member end portions and positioned oppositely of said insulating inner, annular recessed portion,

said annular spacer end portions having a plurality of inclined inner sealing surfaces on said inner surface and an outer sealing surface on said outer surface,



said coupling member end portions being axially advanced into the opposite ends of said insulating sleeve so that said annular sealing surfaces thereof are moved into sealing contact with said annular spacer inclined inner sealing surfaces,

said annular spacer outer sealing surface being expanded radially outwardly into sealing contact with said insulating sleeve to position said annular spacer end portions in abutting sealing relation with said insulating inner, annular recessed portion to form a fluid tight seal between said coupling member end portions and said insulating sleeve,

said annular spacer inner sealing surfaces and said outer sealing surfaces being wedged into sealing contact between said coupling member annular sealing surfaces and said insulating sleeve inner annular recessed portion,

a rigid reinforcing sleeve being in contact with and surrounding said insulating sleeve,

said rigid reinforcing sleeve being axially fixed on said insulating sleeve, and

means completely surrounding said rigid reinforcing sleeve for resisting corrosive damage to said reinforcing sleeve.

4,398,755

FLEXIBLE FLUID CONDUCTIVE COUPLING FOR FLUID TRANSFER SYSTEMS

Richard S. Gureghian, Burlington, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Jan. 19, 1981, Ser. No. 225,896

Int. Cl.³ F16L *27/10*

U.S. Cl. 285—223 **12 Claims**

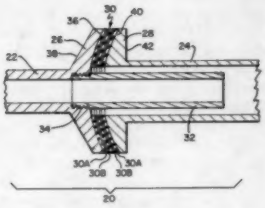
1. A flexible fluid-conductive coupling for use with a fluid transfer system including first and second conduits to be joined for fluid flow therebetween, said coupling comprising:

a first flange fixedly connected to and extending radially outward from said first conduit;

a second flange fixedly connected to and extending radially outward from said second conduit;

opposing first and second bearing surfaces disposed respectively on said first and second flanges and in spaced relation relative to one another;

bearing and sealing means for fixedly and flexibly connecting said first and second flanges consisting of alternating bonded laminae of resiliently deformable elastomer and substantially rigid material, said bearing and sealing means bonded between and to the first and second bearing surfaces whereby said bearing and sealing means accommodates misalignment between the first and second conduits; and



an extension tube fixedly connected to one of the conduits and disposed within and radially spaced from the other of the conduits at least for a portion of its axial length; said extension tube for preventing the obstruction, due to excessive misalignment of the first and second conduits, of flow of the fluid therebetween and for establishing a fluid stagnation region thereby protecting the bearing and sealing means from abrasive injury due to flowing particulate matter in the fluid stream.

4,398,756

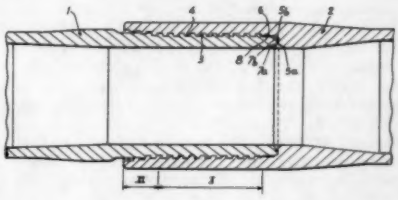
CYLINDRO-CONICAL PIPE JOINT

Jean Duret; Charles Soulier, and Georges Trouillet, all of Aulnoye-Aymeries, France, assignors to Vallourec, S. A., Paris, France

Continuation of Ser. No. 187,155, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 43,224, May 29, 1979, abandoned, which is a continuation of Ser. No. 780,847, Mar. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 370,141, Jun. 14, 1973, abandoned. This application Nov. 13, 1981, Ser. No. 321,330

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—334 **5 Claims**



1. In a separable joint for metal pipes in which a seal is formed between the end of a male member and a shoulder formed on the inside of a female member, said shoulder comprising a central frusto-conical zone the smaller end of which is directed toward the end of the female member and a frusto-conical outer zone which slopes in the opposite direction, the end of the male member having a central zone corresponding to said central zone of the female member and an outer zone having a shape which mates approximately with said outer zone of said female member, the end of said male member being provided with external threads and the end of said female member with internal threads, the improvement accord-

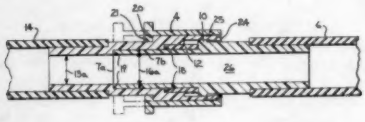
ing to which the threads on each member lie partly on a cylindrical surface occupying the major portion of the threaded part of said member, said cylindrical surface extending from a point near said female shoulder in the case of said female member and the said end of said male member in the case of said male member, and partly on a frusto-conical surface near said end in the case of said female member and more remote from said end than said cylindrical threads in the case of said male member, wherein said frusto-conical threads occupy a surface from 15 to 25% as long as that occupied by said cylindrical threads, said threads having roots and crests substantially parallel to the geometrical axis of said joint, the axial width of said threads being substantially greater than the height of the threads, the flanks of the threads on both the male and the female members which come into contact during the make-up of the joint being substantially perpendicular to the axis of the joint, throughout the cylindrical part of the threads there being a clearance between the crests of the threads of the male member and the bottoms of threads of the female member, and between the bottoms of the threads of the male member and the crests of the threads of the female member, the rear flanks of the threads of the female member lying on said frusto-conical surface being bevelled to facilitate the insertion of said male member and the end of said female member having a conical entrance to facilitate said insertion.

4,398,757

LAMINAR FLOW CONNECTOR FOR BLOOD AND STERILE SOLUTIONS

Larry K. Floyd, 2720 Almsbury, Brookfield, Wis. 53005, and Bert S. Bodnar, 125 Clinton St., Parkridge, Ill. 60068

Filed Feb. 18, 1981, Ser. No. 235,689
Int. Cl.³ F16L *37/18*
U.S. Cl. 285—315 **2 Claims**



1. A laminar flow connector for blood and sterile solutions, comprising

first and second coupling members releasably connected to define a coaxial fluid passageway to conduct said solutions,

said first coupling member providing a tubular opening of a substantially uniform first diameter and an external circumferential surface of varying diameter including a first surface portion of a first diameter adjacent to a first end and a second surface portion of a second diameter substantially greater than said first diameter and forming an annular projection providing an annular shoulder between said first and second surface portions,

an annular seal removably connected to surround said first surface portion of said first member and extending from said annular shoulder to a location spaced from said first end,

said second coupling member providing a tubular opening of varying diameter including a first tubular portion with a substantially uniform first diameter and a second tubular portion with a second diameter larger than said first diameter and an annular stop separating said first and second tubular portions with said annular stop removably engaging said first end of said first coupling member to provide a substantially uniform diameter passageway with said first and second members joined together and with said second tubular portion removably engaging in a tight fit said first surface portion of said first member and a third tubular portion with a third diameter larger than said second diameter and forming an annular ledge between said second and third tubular portions to removably engage said seal in a tight fit in a connected position,

said second coupling member including a series of circumferentially spaced fingers axially extending to surround said annular projection provided by said first member, with each finger including a radially extending camming surface, and

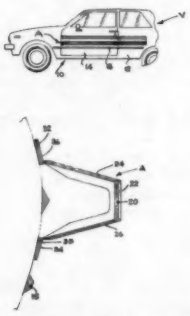
an annular sleeve axially movable along said second member between a first position allowing said fingers to be biased radially outward to permit axial movement between said first and second members and a second position to engage a circumferential surface of said sleeve with said camming surfaces to bias said fingers radially inward to firmly engage said fingers against said annular projection to provide a firm connection between said first and second connectors without directly subjecting said seal to the solutions within said passageway.

4,398,758

PROTECTIVE GUARD DEVICES FOR USE WITH AUTOMOTIVE VEHICLES

Gilbert Tabares, 7244 Redlands, Apt. H–3029, Playa del Rey, Calif.

Filed Jun. 15, 1981, Ser. No. 273,977
Int. Cl.³ B60R *13/00*
U.S. Cl. 293—128 **4 Claims**



1. A removable protective guard device for use with vehicles having metal wall section of any contour, said device comprising:

a generally U-shaped, hollow frame structure of a material capable of withstanding high impact forces, said frame structure including an impact receiving section and a pair of leg sections extending from opposite edges of said impact receiving section in angular relationship to said impact receiving section;

a pair of members for attaching said frame structure to said metal wall section, one of said attachment members being attached to each of said leg sections at an end thereof remote from said opposite edges of said impact receiving section, each of said attachment members extending outwardly away from the interior of said frame structure and each of said attachment members being angulated relative to said impact receiving section, said attachment members being comprised of a resilient and flexible material such that the attachment members are capable of conforming to the contour of said metal wall section; and

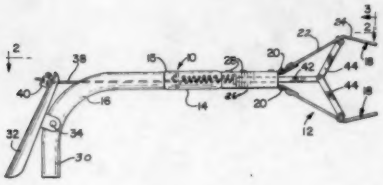
fastening means associated with each of said attachment members for releaseably holding said frame structure in a desired position on said metal wall section.

4,398,759

LITTER PICK UP DEVICE

Alvin J. Manola, 22 E. Whitehall, Northlake, Ill. 60164

Filed Apr. 30, 1981, Ser. No. 259,031
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BA **5 Claims**



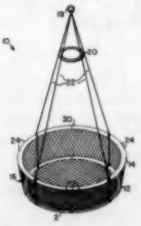
1. A portable pick-up device for engaging, grasping, encompassing and disposing of animal litter, in particular, dog litter, the improvement comprising:
- a handle having an operating lever pivotally connected thereto and adapted to pivot upon engagement by a user;
- a shaft comprising hollow tube means extending from the handle;
- jaw means with portions adapted to move between an open and closed position extending from said shaft;
- an operating mechanism comprising a cable attached at one end to the operating lever, and having a second end;
- toggle link means interconnected between the second end of said cable and said jaw means;
- spring means for engaging the cable and biasing the jaw means into said open position by acting directly on said toggle link means and said cable;
- lock means mounted on said lever cooperative with the cable for selective adjustment of the length of the cable thereby enabling the adjustment of the opening of the jaw means;
- said shaft includes first and second hollow tube portions;
- a friction slip connection comprising a reduced diameter portion on said first tube portion insertable within the second hollow tube portion to allow for relative rotation between the two tube portions; and
- said friction slip connection being biased together by the force of said spring means acting on said toggle link means and the adjustment of said cable provided by said lock means.

4,398,760

SUBMERSIBLE NET FOR HELICOPTER RESCUE MISSIONS

Vernon C. Kirk, 13120 Everglade, Clearlake Oaks, Calif. 95423

Filed May 11, 1981, Ser. No. 262,547
Int. Cl.³ B66C *1/12*
U.S. Cl. 294—77 **11 Claims**



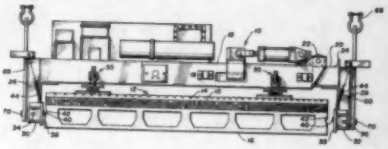
1. A submersible rescue net comprising:
- a rigid, non-floatable tubular base ring provided with a plurality of apertures that allow a fluid in ingress and egress its interior;
- a rigid, non-floatable tubular rail ring provided with a plurality of apertures that allow a fluid to ingress and egress its interior;
- netting means extending across said base ring and between said base ring and said rail ring, whereby said netting forms a base and sidewalls when said rail ring is vertically separated from said base ring, and whereby the top of said rail ring is uncovered;
- a hoist means; and
- a plurality of shroud lines coupling said rail ring to said hoist means.

4,398,761

DEVICE FOR LIFTING AND TILTING CONCRETE PANELS

David W. Hanson, Golden Valley; Richard C. Nash, New Prague, and Richard R. Koehn, Prior Lake, all of Minn., assignors to Fabcon, Incorporated, Savage, Minn.

Continuation-in-part of Ser. No. 169,048, Jul. 15, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,712
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—81 R **23 Claims**



1. Apparatus for lifting concrete panels, said apparatus including two or more lifting clamps, each of which comprises:
- a first beam;
- a second beam;
- a first clamping head rigidly connected to said first beam; said first clamping head constructed and arranged to engage said panel on one sidewall thereof;
- a second clamping head rigidly connected to said second beam, said second clamping head constructed and arranged to engage said panel on an opposite sidewall thereof;
- means for moving said first beam relative to said second beam to selectively engage and disengage one or both of said clamping heads from the sidewall of said panel; and
- connection means connected to said apparatus and constructed and arranged for connection to a lifting cable, said connection means providing for pivotal movement of said apparatus and said first and second clamping heads about an axis through said panel below said beams.

4,398,762

PICKUP DEVICE FOR LIFTING CONCRETE BODY

Ernst Haeussler, Grashofstr. 47, 4300 Essen-Bredeney, Fed. Rep. of Germany; Ernst Hatz, Darmstadt, Fed. Rep. of Germany; Olle Malmen, Askim, Sweden; Henning Schilla, Essen-Frintrop, and Karl E. Schlick, Rüsselsheim, both of Fed. Rep. of Germany, assignors to Ernst Haeussler, Essen-Bredeney, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,326
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012278; Mar. 29, 1980, 3012280
Int. Cl.³ B66C *1/66, 1/36*
U.S. Cl. 294—89 **4 Claims**

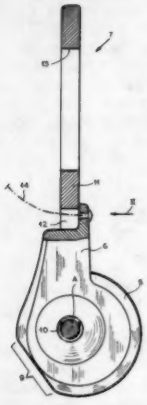
1. A pickup device for lifting a body from which projects a bolt having a relatively narrow shaft embedded in and projecting from said body and a relatively wide head on said shaft spaced from said body, said device comprising:

a shackle lying generally in a shackle plane and having a crosspiece defining a lift eye and a pivot eye;

a pickup member pivotal on said pivot eye on said shackle about a pickup axis and having

a generally radially extending actuation arm having an outer end angularly engageable with said crosspiece, the radial distance between said outer end and said axis being greater than the diameter of said pivot eye, and

an angularly elongated and outwardly open pickup slot lying generally in a plane perpendicular to said axis and having a relatively wide end permitting radial passage of said head into and out of said slot and an angularly opposite relatively narrow end internally sufficiently wide to accommodate said head but externally insuffi-



ciently wide to permit radial passage of said head out of said slot, said slot being internally sufficiently wide between said ends to permit said head to pass angularly along said slot between said ends with said shaft extending out of said slot, whereby said member can pivot about said axis with said bolt engaged in said slot, and

means for pivoting said pickup member on said pivot eye between a pickup position with said arm lying against said crosspiece and said wide end of said slot opening generally perpendicularly to said axis and said shackle plane and a holding position with said actuation arm generally perpendicular to said shackle plane and said narrow end of said slot opening generally perpendicularly to the axis in line with said shackle plane away from the crosspiece.

4,398,763

LOAD CARRIER

Franklin S. Louw, P.O. Box 116, Bedfordview, 2008, South Africa

Filed Jul. 2, 1981, Ser. No. 280,162

Claims priority, application South Africa, Sep. 3, 1980, 80/5445

Int. Cl.³ B60D *3/00*

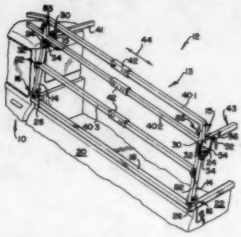
U.S. Cl. 296—3 **10 Claims**

1. A load carrier for a motor load vehicle, the load carrier comprising

a frame which is substantially rectangular;

at least four legs depending from the frame, the upper ends of the legs being pivotally connected to the frame about axes disposed longitudinally relative to the intended direction of travel of the motor load vehicle so as to permit stepless adjustment in the transverse spacing between the lower ends of the legs;

a foot at the lower end of each leg for connection to the body of the motor load vehicle such that, in use, the frame



is supported in an elevated position above the load carrying portion of the vehicle; and

locking means to lock the legs in adjusted positions.

4,398,764

AIR BALANCE PANEL FOR VEHICLES

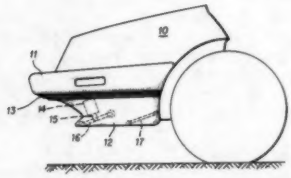
Teiji Okuyama, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 2, 1981, Ser. No. 298,582

Claims priority, application Japan, Sep. 8, 1980, 55-124422

Int. Cl.³ B62D *37/02*

U.S. Cl. 296—15 **7 Claims**



1. An air balance panel for vehicles having a bumper, comprising

an air balance panel integrally and unitarily formed with said vehicle bumper which comprises plastic and which further comprises an expandable flexible portion for integrally interconnecting said air balancing panel with said vehicle bumper; and

drive means operatively connected to said air balance panel for acting on said expandable flexible portion of said air balance panel according to a predetermined signal.

4,398,765

COVER PLATE FOR SPARE WHEEL HOUSING

Takeshi Ishikawa, Yokohama, Japan, assignor to Nissan Motor Co. Ltd., Yokohama, Japan

Filed Jul. 31, 1981, Ser. No. 288,912

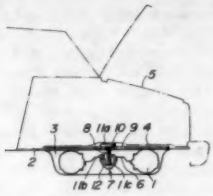
Claims priority, application Japan, Aug. 11, 1980, 55-113662[U]

Int. Cl.³ B60P *3/22*

U.S. Cl. 296—37.2 **1 Claim**

1. A structure for retaining a spare wheel housing, comprising a cover plate having anchoring means engaging a hub hole of a wheel disc of a spare wheel housed in said spare wheel housing, said anchoring means comprising a disc-like head, a shaft depending from a lower surface of the head and a plurality of fingers at a lower end of said shaft and extending upwardly to form an imaginary circle larger than the hub hole of said spare wheel, said cover plate being provided at its center with a hole smaller than said disc-like head for holding said anchoring means and being further provided at a location

radially spaced a predetermined distance from said center hole with a hole communicating with said center hole through an



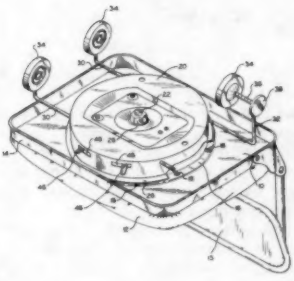
elongated slot formed in said cover plate for engaging the fingers of said head for lifting the cover plate.

4,398,766

BOAT SEAT MOUNTING STRUCTURE

Lynn E. Everett, New Philadelphia, Ohio, assignor to Tusco, Inc., Gnadehutten, Ohio

Filed Apr. 27, 1981, Ser. No. 257,811
Int. Cl.³ A47C *1/08*
U.S. Cl. 297—252 **10 Claims**



1. A removable seat for attachment to a support comprising:
a mounting housing secured to the seat;
a plurality of support-engaging members slidably disposed in said housing for removably attaching the seat to the support; and
locking means for releasably securing each of said support-engaging members to said housing, each of said locking means including a lever pivotally attached to said housing having detent means formed therein for slidably receiving one of said members and resilient means attached to said lever for urging said detent means into frictional engagement with said member, said lever including a handle portion extending outwardly from said housing whereby said lever can be moved in opposition to said resilient means to disengage said support-engaging member from said housing.

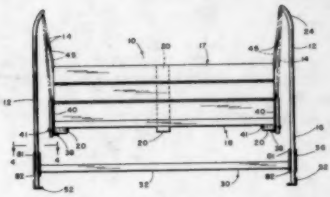
4,398,767

PATIO SWING

Richard M. McGuigan, 8642 Keystone Dr., Omaha, Nebr. 68134

Continuation of Ser. No. 48,465, Jun. 27, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,679
Int. Cl.³ A47D *13/10*
U.S. Cl. 297—280 **11 Claims**

1. A patio swing comprising a frame, a seat having a substantially horizontal lower portion and an upwardly extending back portion, said frame comprising right and left elongated upright side support assemblies at the right and left sides of said seat respectively, and extending higher than said seat, said side support assemblies each having lower end portions extending below said seat, a bottom assembly connecting said lower portions of said side support assemblies, each side support assembly having forward and rearward upright post portions, said side support assemblies each having an upper end portion, a flexible suspending means connecting said upper end portions of said right and left side supports to right and left sides of said seat whereby said seat swings in an arc forwardly and rearwardly with respect to said posts, right and left upper supporting means attached to said right and left side supports respectively and having thereon right and left support points respectively, said right and left support points being disposed in-



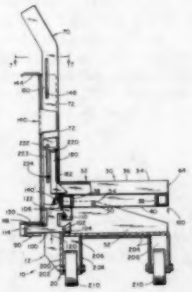
wardly toward the center of said seat from said right and left side supports respectively, said flexible suspending means being connected to said right and left support points respectively, said seat being substantially spaced from said posts for avoiding collisions therewith during swinging, said side support assemblies each being a U-shaped member having forward and rearward upwardly extending post portions connected by an upper bight portion inclined inwardly toward a place disposed above the center of said seat whereby said right and left support points are on said bight portions and said support points are offset inwardly from said post portions.

4,398,768

SIDE DUMP CART

Ronald K. Parks, and Arden K. Zink, both of 10602 Olive St., Omaha, Nebr. 68128

Filed Aug. 13, 1981, Ser. No. 292,350
Int. Cl.³ B60P *1/24*; B62B *3/08*
U.S. Cl. 298—2 **11 Claims**



1. A side dump cart comprising a frame, wheels attached to and supporting said frame, a platform assembly having a load-carrying platform pivotably mounted to said frame for tilting about a substantially horizontal platform axis from a load travel position to a load dumping position, said platform having an off-load side, said cart being free of obstruction to the falling of load from said platform off-load side, a latch, means movably attaching said latch to said frame and permitting said latch to move from latching to unlatching positions, said platform assembly having means thereon releasably engageable by said latch for preventing said load-carrying platform from tilting from travel position to dumping position, said latch

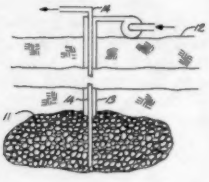
having a pressing means operably associated therewith and having a pressing surface which when pressed by the cart operator will cause said latch to move from latching position to unlatching position, a movable guard extending across said pressing surface for preventing accidental pressing by the operator, guard control means attached to said movable guard and movably connected to said frame for permitting the operator to intentionally move the guard away from the pressing surface, whereby upon intentional movement of the guard control means to withdraw the guard away from said pressing surface, the operator can gain access to the pressing surface and unlatch said load-carrying platform causing same to automatically tilt toward its off-load side.

4,398,769

METHOD FOR FRAGMENTING UNDERGROUND FORMATIONS BY HYDRAULIC PRESSURE

Charles H. Jacoby, Tempe, Ariz., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Nov. 12, 1980, Ser. No. 206,088
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—4 **48 Claims**



1. A method for enhancing exposure of leachable mineral values adjacent a solution mining cavity having a substantially unsupported roof in a subterranean formation comprising the steps of:

substantially filling such a subterranean cavity with a liquid; and

repeatedly increasing hydraulic pressure of the liquid in the subterranean cavity from a minimum pressure of about the hydraulic head between the subterranean cavity and the ground surface or less, to a maximum pressure sufficient to lift the roof of the cavity and less than sufficient for lifting the overburden above the top of the stress arch which forms over the subterranean cavity, and then decreasing hydraulic pressure to such minimum pressure, the time interval of increasing hydraulic pressure to the maximum pressure being at least about two hours.

4,398,770

WIRE SPOKE VEHICLE WHEEL AND METHOD OF MANUFACTURE

Richard W. Smith, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

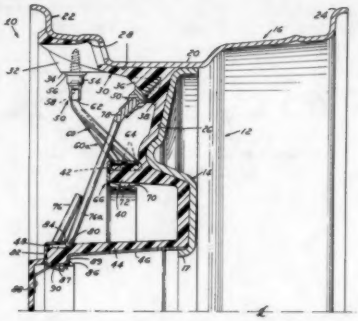
Filed Feb. 23, 1981, Ser. No. 237,504
Int. Cl.³ B60B *7/00*
U.S. Cl. 301—37 SS **7 Claims**

1. A method of manufacturing a composite vehicle wheel assembly comprising the steps of:

(a) forming a vehicle wheel including a disc having an axially oriented outboard face and a rim having a radially oriented inboard face contiguous with said disc outboard face, said disc including a central hub opening and an array of mounting openings surrounding said hub opening, at least said rim and disc face portions of said wheel being formed in a molding operation to include on said disc outboard face a hollow shell circumferentially surrounding said hub opening, a ledge axially projecting from said disc outboard face radially intermediate said mounting openings and said rim, and a circumferential array of radially facing pockets on each of said ledge and shell opening at an edge of said ledge and shell remote from said disc,

(b) fixedly securing on said inboard rim face first and second pluralities of nipples in respective axially spaced circumferential arrays by embedding a portion of each said nipple into said face, said first plurality being mounted adjacent an edge of said rim face axially remote from said disc and said second plurality being mounted at the juncture of said rim and disc faces, each of said nipples including a nipple opening directed generally radially inwardly,

(c) mounting a first plurality of wire spokes to said wheel by inserting one end of each said wire spoke of said first



plurality into a corresponding said nipple opening among said first plurality of nipples, seating the second end of each said wire spoke of said first plurality in a corresponding said pocket on said ledge and then assembling an annular retaining ring onto said ledge to secure said second ends in said pockets, and

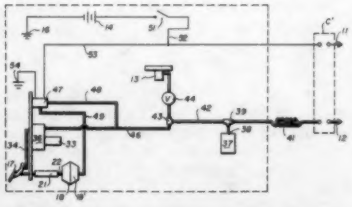
(d) mounting a second plurality of wire spokes to said wheel by inserting one end of each said wire spoke of said second plurality into a corresponding nipple opening among said second plurality of nipples and seating the second end of each said wire spoke of said second plurality in a corresponding said pocket on said shell, and then assembling an annular retaining ring onto said shell to secure said second ends in said pockets.

4,398,771

BRAKING SYSTEM FOR TOWED VEHICLES

Walter W. McCurry, and Walter G. Pettit, both of 8264 Tanoak Way, Citrus Heights, Calif. 95610

Filed Nov. 19, 1980, Ser. No. 208,483
Int. Cl.³ B60T *7/20*
U.S. Cl. 303—15 **11 Claims**



1. A braking system for automatically braking a towed vehicle having an engine, a battery and a braking arrangement including a brake pedal, the towed vehicle being detachably coupled to a towing vehicle also having an engine, battery and

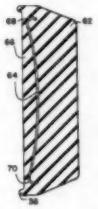
braking system and having a vacuum line using compressible fluid and a braking unit including an electrical control circuit comprising, in combination, vacuum responsive actuator means on said towed vehicle, means for operatively connecting said actuator means to said towed vehicle brake pedal, a source of vacuum on said towed vehicle, conduit means including a normally closed, solenoid operated valve for communicating said source of vacuum with said actuator means, circuit means on said towed vehicle including a normally open breakaway switch for connecting said towed vehicle battery to said solenoid operated valve, means for detachably connecting said circuit means and said conduit means to said control circuit and said vacuum line and said towing vehicle respectively in the coupled condition of said towed and towing vehicles for energizing said solenoid operated valve and supplying a vacuum to said actuator means to brake said towed vehicle during the braking of said towing vehicle, said breakaway switch being responsive to the uncoupling of said towed and towing vehicles for energizing said solenoid operated valve to apply a vacuum to said actuator means from said vacuum source for braking said towed vehicle should the towed vehicle be dissociated from the towing vehicle while being towed.

4,398,772

DRILL PIPE PROTECTOR

Richard Odell, Houston, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 10, 1981, Ser. No. 300,863
Int. Cl.³ F16C *17/00*
U.S. Cl. 308—4 A **12 Claims**



1. A drill pipe protector adapted to be mounted on a generally vertical drill pipe for rotation therewith comprising:

a cylindrical body of an elastomer, said body having inside and outside surfaces and having a split formed longitudinally therein;

an inwardly curved and longitudinally split cylindrical metal band encased in said elastomeric body, said band having an inside diameter greater than the inside diameter of said elastomeric body and dividing said body into inner and outer volumes such that when said protector is tension mounted on a drill pipe, said band captures and compresses a convex inner volume of said elastomer between said band and said drill pipe;

connector means formed on said band at said split;

a sealing bead continuously formed along the periphery of the inside surface of said elastomeric body and along each side of said longitudinal split therein, said bead providing a fluid tight engagement between said protector and said drill pipe; and

a locking pin engaging said connector means and adapted to positively lock said protector in fluid tight compressive engagement with said drill pipe.

9. A drill pipe protector adapted to be mounted on a generally vertical drill pipe for rotation therewith comprising:

a cylindrical body of an elastomer, said body having inside and outside surfaces and a longitudinal split formed therein, said outside surface carrying a plurality of circumferentially spaced longitudinally extending flutes, and said inside surface having a plurality of longitudinally extending grooves formed therein;

an inwardly curved and longitudinally split cylindrical metal band encased in said elastomeric body, said band having an inside diameter greater than the inside diameter of said body and dividing said body into an inner convex volume and an outer volume such that when said protector is tension mounted on a drill pipe, said band captures and compresses said inner convex volume of said elastomer between said band and said drill pipe;

connector means formed in said band at said split for receiving a locking pin;

a sealing bead continuously formed around the periphery of said inside surface of said elastomeric body and along each side of said split formed therein, said bead providing a fluid tight engagement between said protector and said drill pipe; and

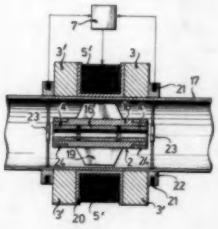
a locking pin which, in cooperation with said connector means, draws said band into a compressional relationship with said inner convex volume and positively locks said protector in fluid tight compressive engagement with said drill pipe.

4,398,773

MAGNETIC SUSPENSION ASSEMBLY FOR A ROTOR

Karl Boden, Jülich, and Johan K. Fremerey, Bonn, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,236
Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919236
Int. Cl.³ F16C *39/00*
U.S. Cl. 308—10 **8 Claims**



1. A magnetic suspension system comprising:

a stator formed with two stator permanent magnets spaced apart along an axis and an annular coil disposed between said stator permanent magnets and substantially completely bridging the gap between them;

a rotor surrounded by said stator permanent magnets and said coil and rotatable relative to said stator about said axis and out of contact with said stator, said rotor being provided with two rotor permanent magnets axially spaced corresponding to the spacing between the stator permanent magnets and each respectively paired with a stator permanent magnet and poled in mutual repulsion, the stator permanent magnets being in mutual axial magnetic repulsion, and the rotor permanent magnets being magnetically poled in axial repulsion;

detecting means for the contactless detection of axial shifting of said rotor relative to said stator;

circuit means responsive to said detecting means for energizing said coil to superimpose an active magnetic field on the fields of said permanent magnets and restore said rotor to a set point position by magnetic axial force, said stator being formed with a tubular housing and the stator permanent magnets being mounted on said housing along the exterior thereof, said coil surrounding said housing, said rotor being

formed with vanes whereby rotation of the rotor signals fluid flow parameters of a fluid traversing said housing.

4,398,774

CARRIER IN A BEARING ASSEMBLY FOR ENABLING AXIAL MOTION OF A FREE END OF A DRIVE SHAFT

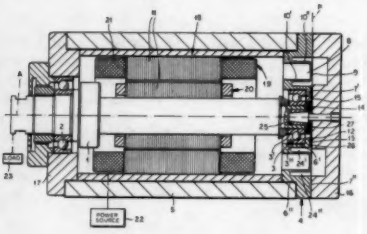
Horst Voll, Hassfurt, and Gerhard Braüne, Euerbach, both of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,812

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034651

Int. Cl.³ F16C *27/04*

U.S. Cl. 308—184 R 3 Claims



1. A bearing assembly comprising a housing, a bearing having a race centered on an axis and a metallic bearing carrier, said carrier comprising:

a thin-walled flat annular section lying in a plane substantially perpendicular to said axis;

a first thin-walled cylindrical section coaxial with said axis and integral at one end with a periphery of said annular section via a thin-walled bend;

a first thick-walled cylindrical section coaxial with said first thin-walled cylindrical section and integral with an end thereof opposite said annular section, said cylindrical sections together forming a first narrow groove, said first thick-walled cylindrical section having a thick flange forming a first attachment member extending parallel to said annular section;

a second thin-walled cylindrical section coaxial with said axis and integral at one end with a periphery of said annular section radially spaced from said first thin-walled section via another thin-walled bend, said first and second thin-walled cylindrical sections extending in the same direction from said annular section to form therewith a wide groove coaxial with said first narrow groove and said axis; and

a second thick-walled cylindrical section coaxial with said axis and integral with an end of said second thin-walled cylindrical section opposite said annular section, and second thick-walled cylindrical section and said second thin-walled cylindrical section together forming a second narrow groove coaxial with said wide groove, said second thick-walled cylindrical section having a second attachment member taking the form of another thick flange extending parallel to said annular section and away from said other thick flange, one of said flanges being connected to said race, the other of said flanges being connected to said housing.

4,398,775

JOURNAL BEARING WITH ONE AXIALLY DIVIDED INNER OR OUTER RING

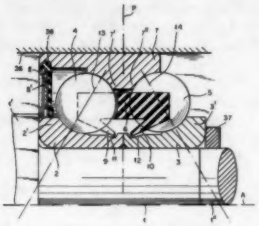
Heinrich Hofmann; Günter Markfelder, both of Schweinfurt, and Manfred Tröster, Bad Kissingen, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,576

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027485

Int. Cl.³ F16C *33/40, 33/78, 33/60, 33/48*

U.S. Cl. 308—201 5 Claims



1. In a journal bearing comprising an inner ring and an outer ring centered on a common axis, one of said rings being unitary and provided with a pair of oppositely facing first shoulders forming respective internal boundaries of two outwardly shoulderless first peripheral track surfaces, the other of said rings being axially divided into two substantially symmetrical halves and being provided with a pair of confronting second shoulders bracketing said first shoulders and forming respective external boundaries of two inwardly shoulderless second peripheral track surfaces concentric with said first track surfaces, two sets of rotary bodies confined by said first and second shoulders between said first and second track surfaces, and cage means engaging said rotary bodies of each set for holding them peripherally spaced apart,

the improvement wherein said cage means comprises a unitary annular element of resilient material with two oppositely facing arrays of axially open pockets respectively receiving said sets of rotary bodies and with two annular groups of teeth disposed between said rotary bodies snap-fitted into a pair of annular grooves provided inwardly of said second track surfaces on said halves, said teeth of each group extending at an acute angle to said axis from circumferential spaces between adjacent rotary bodies of the respective set to one of said groove for holding said halves, said one of said rings and said rotary bodies together in a state of separation from other structure.

4,398,776

ROLLER BEARING WITH ANNULAR RETAINING DISKS

Hans-Dieter Kütemeier, Sennfeld, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,542

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044180

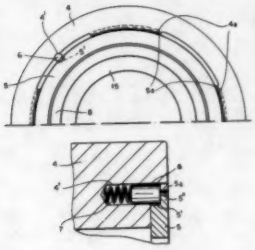
Int. Cl.³ F16C *19/28*

U.S. Cl. 308—207 R 6 Claims

1. In a journal bearing wherein an inner member with a cylindrical outer peripheral surface is coaxially surrounded by an outer member with a cylindrical inner peripheral surface, said peripheral surface being separated by an annular clearance occupied by a multiplicity of rotary bodies holding said members apart while enabling relative rotation thereof about their common axis, said clearance being bounded on at least one end partly by a first annular disk rigid with one of said members

and partly by a second annular disk coplanar with said first disk, the other of said members having at least one end face with peripherally spaced retaining lugs forming a bayonet coupling with coacting lugs of said second disk for holding same in a locking position on said other of said members,

the improvement wherein said other of said members is



provided with a spring-loaded detent received in an axially extending bore of said end face between two of said retaining lugs and in confronting relationship with a marginal zone of said second disk, said marginal zone being formed with a depression receiving said detent in said locking position for preventing a detachment of said second disk.

4,398,777

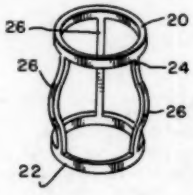
ROLLER ASSEMBLY WITH ROLLER RETENTION MECHANISM

William W. Murphy, Goshen, Conn., assignor to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 223,245, Jan. 8, 1981, abandoned. This application Dec. 16, 1982, Ser. No. 450,353

Int. Cl.³ F16C *41/04*

U.S. Cl. 308—207 R **4 Claims**



1. A roller assembly comprising: a body with a cylindrical bore; a single-use disposable roller retention mechanism located inside the bore, said single-use disposable roller retention mechanism being adapted to be removed before the rest of the roller assembly is placed in operation, a plurality of rollers extending lengthwise inside the bore, said rollers extending around the entire circumference of the bore with all the rollers in contact with the wall of the bore, said roller retention mechanism having at least three circumferentially spaced portions, each extending radially between two adjoining rollers to contact said two adjoining rollers in a manner to push these two adjoining rollers apart circumferentially to keystone all the rollers so that all the rollers in the circumferential space between the circumferentially spaced portions are in contact, all the rollers being pressed against the wall of the bore with sufficient force to prevent axial movement of the rollers, said rollers being prevented from falling radially inwardly into the center of the bore solely by the keystoning effect of said circumferentially spaced portions.

4,398,778

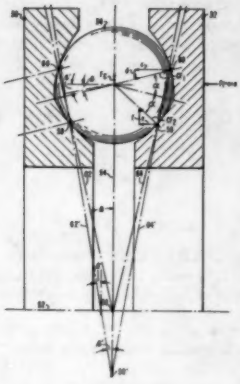
BALL BEARING

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Continuation-in-part of Ser. No. 205,736, Nov. 10, 1980, abandoned. This application Mar. 23, 1981, Ser. No. 246,862

Int. Cl.³ F16C *33/58*

U.S. Cl. 308—235 **5 Claims**



1. A high speed axial thrust bearing comprising two race rings with opposed race surfaces forming a bearing cavity therebetween, and bearing balls disposed within said cavity so as to rotatably support said race rings relative to each other, said race rings each having two races each with two circular contact areas with said rollers for supporting said rollers, said races being so arranged that secants through the ball and race contact points form an angle β' with a plane normal to the bearing axis which angle β' is between 40% and 20% of the ideal angle β at which the secants intersect on the bearing axis.

4,398,779

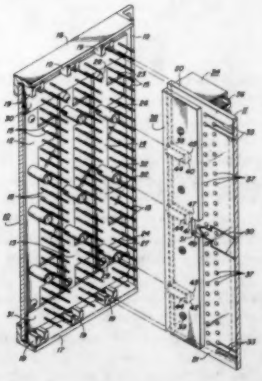
KEYING APPARATUS FOR INTERCONNECTING ELECTRICAL COMPONENTS

Dean D. Ling, Blacklick, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1980, Ser. No. 217,708

Int. Cl.³ H01R *13/64*

U.S. Cl. 339—17 LC **11 Claims**



1. In combination, an electrical component presenting a keying plate on at least one side, said plate having a first and an

opposite, second face and a leading edge, and a connector block adapted to engage an array of backplane terminal pins said block having a surface abutting said first keying plate face, said plate having a first and a second notch formed inwardly from said leading edge, said notches being spaced and located at predetermined locations on said plate selected from a plurality of possible fixed locations on said plate, said notches being dimensioned to admit a first and a second dowel correspondingly spaced associated with said array of terminal pins, said surface of said connector block having flutings formed therein dimensioned to admit said dowels, said flutings being spaced to correspond to said plurality of possible fixed locations on said plate.

4,398,780

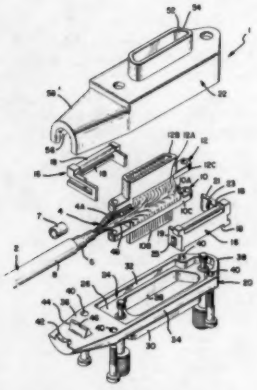
SHIELDED ELECTRICAL CONNECTOR

Lawrence G. Novotny, Clemmons, and Elvert S. Watts, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 181,014, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 54,759, Jul. 3, 1979, abandoned. This application Sep. 15, 1982, Ser. No. 418,367

Int. Cl.³ H01R *13/658*

U.S. Cl. 339—49 R 3 Claims



1. A shielded connector for multiple conductor cable having a male and female connector pair with terminals thereof having aligned wire connecting portions and oppositely projecting mating portions adjacent mating sides of said connector pair, the improvement comprising:

first and second metal intermated shells enclosing said connector pair and having a first opening encircled by a first flange exposing a first mating side of one of said pair of connectors, and second opening encircled by a second flange exposing a mating side of the other of said connectors,

said shells enclosing a cable entrance for wires connected to said pair of connectors, and

fastener means extending through said intermated shells to connect together, plural, stacked pairs of intermated shells, and wherein a plug mating side of said pair of connectors will interfit with a receptacle mating side of another of said pair of connectors so that a pair of multiple conductor cables are electrically coupled together.

4,398,781

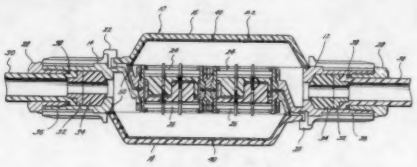
SEALING ASSEMBLY FOR A GEOPHYSICAL CABLE CONNECTOR

Petre F. Dan, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,202

Int. Cl.³ H01R *4/00*

U.S. Cl. 339—94 M 3 Claims



1. In a geophysical cable connector having two interconnecting bodies each having a plurality of coacting electrical connectors and a cover connected to each body by a plurality of screws, the improvement of a sealing assembly comprising,

a sealing bladder gasket positioned between each body and cover,

said gasket including a plurality of openings around its outer periphery for receiving said screws,

said gasket including a sealing ridge extending outwardly from one side of said gasket entirely around the gasket and spaced inside of said openings,

each body including a recess inside of said screws for receiving the sealing ridge,

said gasket being enclosed inside of said ridge for sealing the interior of the body from the environment.

4,398,782

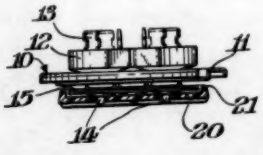
INTERRUPTER FOR MULTISECTION AC CAPACITORS

Paul M. Markarian, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 238,314, Feb. 26, 1981. This application Apr. 14, 1981, Ser. No. 254,339

Int. Cl.³ H01G *1/14*

U.S. Cl. 339—147 C 5 Claims



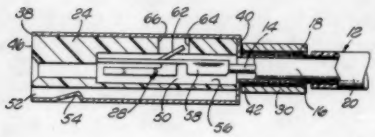
1. An interrupter for a round multisection AC capacitor comprises a molded disc of material chemically inert to capacitor dielectric fluid with holes therein in an equilateral triangular array, one side of said disc having a circumferential flange around its periphery and the other side of said disc bearing ribs extending outwardly from the center of said disc in a snowflake arrangement with curved ribs and curved junctions, each of said holes being located between adjacent ribs and being separated from another of said holes by said ribs.

4,398,783

COAXIAL CABLE CONNECTOR

Michael J. Kelly, Riverside, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,889
Int. Cl.³ H01R 17/18
U.S. Cl. 339—177 E 9 Claims



1. An electrical connector for connecting a coaxial cable to a plurality of terminal pins including a signal pin and a plurality of ground pins spaced outwardly from said signal pin in a predetermined pattern, said coaxial cable including inner and outer conductors, comprising:

a hollow metal shell containing an insulator having a front and a rear, said shell being adapted to be connected to said outer conductor of said cable;

a plurality of longitudinally extending grooves in the surface of said insulator opening at said front and arranged in a pattern corresponding to said predetermined pattern whereby said grooves may receive said ground pins;

the wall of said shell having contact elements thereon facing one of said grooves for engaging a ground pin;

a contact cavity in the interior of said insulator extending from said front to said rear and positioned to receive said signal pin; and

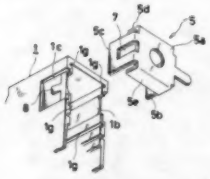
a contact mounted in said cavity adapted to be connected to said inner conductor of said cable.

4,398,784

JACK ASSEMBLY STRUCTURE

Yukio Takihara, Kaizuka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jun. 23, 1981, Ser. No. 276,495
Int. Cl.³ H01R 13/70
U.S. Cl. 339—182 R 7 Claims



1. A jack assembly structure comprising:

a box-shaped jack case;

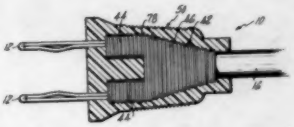
a plurality of contact pieces mounted in the jack case, at least one of said contact pieces being a rectangular plate having parallel outer pieces projecting from two opposite sides thereof and parallel inner pieces projecting from the other two opposite sides thereof, each of said inner pieces having a width smaller than the distance between said outer pieces, and said at least one contact piece being mounted to said openings of said jack case such that inner surfaces of said outer pieces are disposed against outer surfaces of the lateral walls of said jack case, and lateral edges of said inner pieces are disposed against inner surfaces of said lateral walls.

4,398,785

ELECTRICAL CONNECTOR AND METHOD OF MAKING SAME

Paul A. Hedrick, Georgetown, Ky., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 28, 1981, Ser. No. 306,113
Int. Cl.³ H01R 13/405, 13/504, 19/04
U.S. Cl. 339—196 R 4 Claims



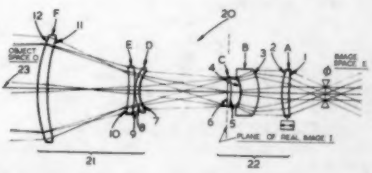
1. An electrical connector comprising two spaced contacts; an electrical cord having a pair of insulated stranded conductors; each of said contacts being mechanically and electrically connected to the bared end of a corresponding one of said conductors to form a pair of spaced connections; a first body of molded insulating material having a pair of spaced arms joined to a base; each of said arms surrounding a corresponding one of said connections; said first body having irregular outer surfaces with raised and depressed portions to minimize the possibility of any loose strand at said bared ends of the conductors being forced to said outer surfaces during molding of said first body; and a second body of molded insulating material surrounding said first body and extending between said arms to further insulate said connections.

4,398,786

COLLIMATION LENS SYSTEM

Iain A. Neil, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Mar. 19, 1981, Ser. No. 245,335
Claims priority, application United Kingdom, Apr. 26, 1980, 8013848
Int. Cl.³ G02B 1/02, 23/00, 9/12, 25/00
U.S. Cl. 350—1.4 7 Claims

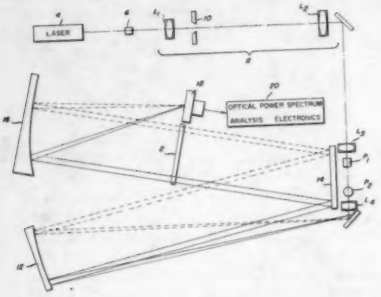


1. An eyepiece or collimation lens system formed by three optically-powered lens elements aligned on a common optical axis and arranged to accept radiation in the infrared wavelength region from a real image and to provide a bundle of parallel rays at an exit pupil, each said lens element being positively powered and made of a material which has a useful spectral bandpass in the infrared wavelength region, the refractive surface of the lens element adjacent said real image being flat and the five other refractive surfaces of said lens elements being substantially spherical.

4,398,787
OPTICAL LEVERAGE TELECENTRIC SCANNING APPARATUS

N. Balasubramanian, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, DC

Filed Jun. 17, 1981, Ser. No. 274,602
Int. Cl.[3] G02B *27/17*
U.S. Cl. 350—6.4 7 Claims



1. Optical leverage telecentric scanning apparatus for scanning a large format film transparency for optical power spectrum analysis, comprising

(a) means supporting the transparency at a given location;

(b) means supplying a collimated laser beam;

(c) refraction means for laterally translating said collimated beam across the transparency;

(d) optical leverage means for magnifying said collimated beam, said optical leverage means including

(1) a first lens arranged between said laser beam supply means and said refraction means, and

(2) a concave parabolic mirror arranged between said refraction means of magnification afforded by said first lens and said mirror being equal to the ratio of the focal lengths of said mirror to said first lens, respectively;

(e) detector means arranged on the opposite side of the transparency from said refraction means for detecting the scan pattern produced by the laser beam which is passed through the transparency, whereby said refraction means and said optical leverage means produce a magnified scan pattern for optical power spectrum analysis of said transparency; and a transform concave parabolic mirror arranged between the transparency and said detector means for focusing said scan pattern from the transparency on said detector means.

4,398,788
BINOCULAR VIEWING DEVICE

Wolfgang Dietz, Lilienthal, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

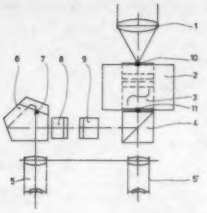
Filed Dec. 3, 1980, Ser. No. 212,478
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948687
Int. Cl.[3] G02B *23/02, 23/12*
U.S. Cl. 350—550 7 Claims

1. A binocular viewing device, for viewing a single image simultaneously with both eyes, comprising:

a beam splitter, arranged in front of the image, for splitting the image into a first beam and a second beam;

a first ocular, arranged in front of the beam splitter for intercepting the first beam, said ocular being adjusted for viewing the image directly through the beam splitter;

an optical imaging system, arranged in front of the beam splitter for intercepting the second beam, said imaging system forming an intermediate image in an image plane; and

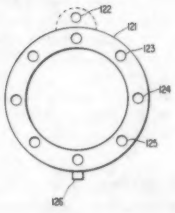


a second ocular, arranged in front of the optical imaging system, said ocular being adjusted to view the image at the intermediate image plane.

4,398,789
OPTO-ELECTRONICALLY CONTROLLED BATHING SYSTEMS

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation-in-part of Ser. No. 29,840, Apr. 13, 1979, abandoned. This application Mar. 20, 1980, Ser. No. 132,150
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.10 10 Claims



3. A plurality of water conduit sections, said sections being secureable together end to end to form a water conduit, each section comprising

a section wall having a bore completely therethrough;

at least one fiber optic element extending along the full length of said wall;

means for securing each section end to end to an adjacent section;

and means for aligning said fiber optic elements of adjacent conduit sections such that, when the conduit sections are secured together end to end, light conveyed through the fiber optic element in a conduit section will be conveyed through the aligned fiber optic element in a further conduit section secured to said one conduit section.

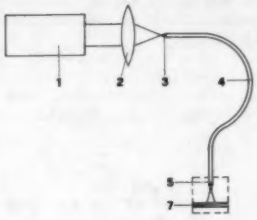
4,398,790
OPTICAL FIBER DEVICE FOR THE TRANSPORTATION AND FOCALIZATION OF LASER RADIATION

Giancarlo Righini; Vera Russo, and Stefano Sottini, all of Florence, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation-in-part of Ser. No. 930,061, Aug. 1, 1978, abandoned. This application Jun. 24, 1980, Ser. No. 162,629
Claims priority, application Italy, Aug. 1, 1977, 9533 A/77
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.18 9 Claims

1. An optical fiber device for the transportation and focalization of laser radiation, comprising a single optical fiber having a core made of glass or quartz and including entrance and exit

terminals, wherein said exit terminal is a convex surface formed in the optical fiber material and doped to create an index of refraction axially different than the main body of the optical fiber; and



said exit terminal of the optical fiber device is a microlens incorporated into the fiber, the radius of curvature of which is controlled by the amount of dopant used to create said axially different index of refraction.

4,398,791

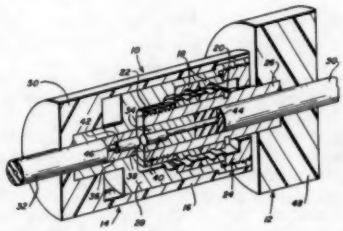
SINGLE CHANNEL OPTICAL SLIP RING

Glenn F. Dorsey, Blacksburg, Va., assignor to Litton Systems, Inc., Blackburg, Va.

Continuation-in-part of Ser. No. 204,762, Nov. 7, 1980, abandoned. This application Feb. 9, 1981, Ser. No. 233,002

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.18 **1 Claim**



1. A single channel optical slip ring assembly comprising:

a hollow rotor shaft having one end of a rotor optic fiber mounted therein,

a rotor graded index rod lens axially mounted in one end of said rotor shaft and optically coupled to said rotor optic fiber,

said rotor lens having a selected focal length for collimating a light signal emitted from said rotor optic fiber into a parallel light beam having a diameter substantially greater than the diameter of said optic fiber,

a stator cylindrical member having one end of a stator optic fiber mounted therein, and having on one end an axially extending collar,

a stator graded index rod lens mounted axially within said stator proximate said collar and optically coupled to said stator optic fiber,

said stator lens having a selected focal length for focusing a collimated light beam into the end of said stator fiber,

means for rotatably mounting said lens end of said rotor shaft within said collar of said stator cylindrical member so that said rotor lens and said stator lens are axially aligned along the axis of rotation and said lenses are separated by a selected gap, thereby optically coupling said optic fibers during relative rotation.

4,398,792

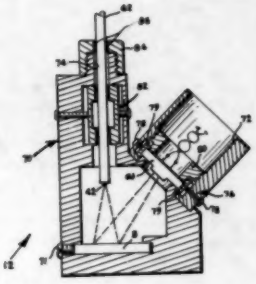
HOLOGRAPHIC COUPLER FOR FIBER OPTIC SYSTEMS

Joseph L. Horner, Cambridge, and Jacques E. Ludman, Westford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1981, Ser. No. 231,088

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.19 **4 Claims**



1. A reflective holographic coupler for coupling the output of an optical source to an optical fiber comprising:

a housing, said housing having a first opening and a second opening therein, said first and said second openings being located juxtaposed one another;

means situated adjacent said first opening for securing within said housing said optical source, means situated adjacent said second opening for securing within said housing an end of said optical fiber, both of said securing means being in the form of adjustably movable clamps;

a single holographic element, said single holographic element being secured within said housing in optical alignment with said optical source and said end of said optical fiber;

said optical source being situated within said first opening at a first preselected position with respect to said single holographic element and said end of said optical fiber being situated within said second opening at a second preselected position with respect to said single holographic element, said first and said second preselected positions being located adjacent the same side of said holographic element; and

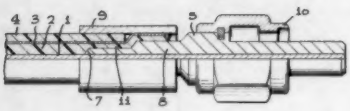
the relationship between said single holographic element, said first preselected position, and said second preselected position being substantially the same as the relationship between a photosensitive medium, a means for forming a beam of temporally and spatially coherent electromagnetic radiation having the same spatial and propagating characteristics as said optical source before said beam impinges upon said photosensitive medium, and the focal point of a converging beam of temporally and spatially coherent electromagnetic radiation which impinges upon said photosensitive medium during the making of said single holographic element from said photosensitive medium;

whereby a beam of electromagnetic radiation emitted from said optical source is directed to and coupled into said end of said optical fiber.

4,398,793
FIBER OPTIC CABLE CONNECTOR

Yukitake Ohta; Yasuo Fukunaga, and Hitoshi Masubuchi, all of Mooka, Japan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 9, 1981, Ser. No. 232,594
Claims priority, application Japan, Feb. 23, 1980, 55-22534[U]
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **6 Claims**

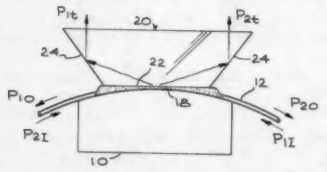


1. A connector for a fiber optic cable having a core, an insulating layer and an outer shell, comprising:
- a connector body having an insertion member for inserting into an end of said fiber optic cable and around said core;
- said insertion member having first and second portions constructed for insertion into the end of the cable when the connector is fastened thereto;
- said connector further including a ferrule for fixing the cable to the connector, the ferrule being adapted to be disposed radially outwardly of both said first and said second portions of said insertion member;
- said ferrule gripping said insulating layer between said first portion and said ferrule and gripping said insulating layer and said outer shell between said second portion and said ferrule to retain said outer shell to said connector body.

4,398,794
DUAL DIRECTIONAL TAP COUPLER

John P. Palmer, Pomona, and Phillip B. Ward, Jr., Brea, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 123,038, Feb. 20, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,478
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.19 **16 Claims**

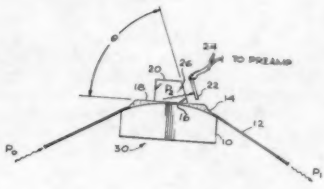


1. A fiber optic tap coupler device for tapping off predetermined portions of optical power from a single optical fiber comprising:
- a curved form for supporting an optical fiber and shaping a portion thereof to a predetermined segment of a circle;
- a single optical fiber mounted on said form;
- means for affixing the optical fiber along a portion thereof to the curved portion of the form of selected radius of curvature by enclosing said portion in epoxy resin applied to the form, the fiber and affixing means in the center section of the curved portion of the fiber being lapped and polished to a preselected depth of penetration into the fiber to develop an extended common planar surface along the fiber portion and the epoxy resin providing extended lateral support for mounting a prism in coupling relationship to the fiber;
- prism means affixed to said planar surface in contact with the optical fiber by means of an optically transparent adhesive, the prism means having at least one face of a predetermined characteristic angle;
- the radius of curvature of the curved portion of the form and the portion of the optical fiber affixed thereto being in the range between 5 and 8 cm, and said characteristic angle of the prism face being selected to be 52+/−5° in order to provide minimum loss with optimum coupling of optical power from the fiber;
- reflecting means formed on said at least one prism face; and
- at least one photosensitive means mounted adjacent said prism in a position to receive and monitor light tapped from said fiber, transmitted by the prism and reflected by the face.

4,398,795
FIBER OPTIC TAP AND METHOD OF FABRICATION

John P. Palmer, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 15,027, Feb. 26, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,756
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.19 **16 Claims**



10. A fiber optic tap device for tapping off a predetermined portion of optical power from a single optical fiber and directing same to a photodiode, which device comprises:
- a curved form for supporting an optical fiber and shaping a portion thereof to a predetermined segment of a circle;
- a single optical fiber;
- means comprising epoxy resin enclosing the optical fiber along a portion thereof to affix it to a curved portion of the form of selected radius of curvature, the radius being selected to be between 5 and 8 cm, the epoxy resin and a center section of the curved portion of the fiber being lapped and polished to a preselected depth of penetration into the fiber to develop a common planar surface along the fiber and the epoxy resin;
- a prism having a predetermined characteristic angle selected to be 70+/−5° and affixed to said planar surface, the prism being supported on the epoxy resin and in contact with the optical fiber by means of an optically transparent epoxy; and
- a photodiode and associated circuitry, the photodiode being positioned adjacent the prism to receive and monitor light transmitted by the prism from the optical fiber.

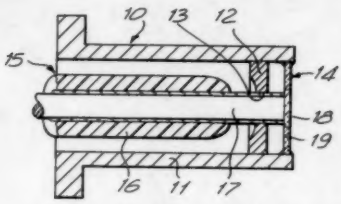
4,398,796
OPTICAL FIBRE TERMINATION

David G. Dalgoutte, Ilkley; John D. Archer, Hipperholme; Peter F. C. Burke, Leeds, and Robert G. Pragnell, Rothwell, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 57,761, Jul. 16, 1979, abandoned. This application Dec. 30, 1981, Ser. No. 335,774
Claims priority, application United Kingdom, Aug. 17, 1978, 33745/78
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **5 Claims**

1. The combination of an optical fibre and a termination, said termination comprising a generally cylindrical tubular ferrule having an inner bore of such a diameter as to receive said fibre, at least one watch jewel carried in said bore adjacent one end

of said ferrule, said watch jewel having a jewel bore, a flat transparent window carried in said bore between said watch jewel and said one end of said ferrule, said fibre being received in said jewel bore with one end terminating adjacent said



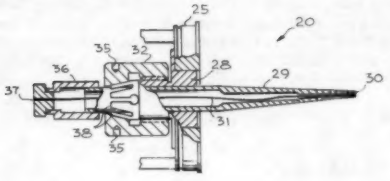
window whereby said window resists movement of said fibre if it grows out of said jewel bore, said window having a light guiding portion adjacent said one end of said fibre, said light guiding portion having a higher index of refraction than the remaining portion of said window.

4,398,797

ECCENTRIC FIBER OPTIC ADJUSTABLE HOLDER

Larry D. Wedertz, Mira Loma, and Oakley G. Ross, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 16, 1981, Ser. No. 244,416
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **21 Claims**



1. An adjustable fiber optic holder comprising:
a hollow elongated tubular member for holding an optical fiber and having an end disc for mounting one end of the optical fiber in a position radially offset from the axis of the member;
a second member having an opening offset from its longitudinal axis for receiving the tubular member therein, the tubular member being axially slidable within said opening;
a housing for encasing the second member while permitting relative rotational movement thereof;
means for fixing the position of the other end of the optical fiber relative to the tubular member;
first locking means for locking the tubular member in an assumed position relative to the second member; and
second locking means for locking the second member in an assumed position relative to the housing.

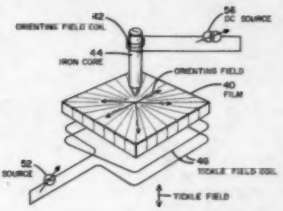
4,398,798

IMAGE ROTATING DIFFRACTION GRATING

John A. Krawczak, Minnetonka, and Ernest J. Torok, Minneapolis, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 18, 1980, Ser. No. 217,878
Int. Cl.³ G02B 5/18; G02F 1/22
U.S. Cl. 350—162.24 **2 Claims**

1. In a diffraction grating formed from a stripe-domain supporting magnetizable film, the method of establishing the inter-domain walls in a radially directed orientation and their separation proportional to the distance from the center of the diffraction grating comprising:
orienting an orienting field coil, having an iron core of substantially zero magnetic remanence, substantially orthoganal to, and above the planar surface of a stripe-domain supporting magnetizable film;
orienting a tickle field coil, having an air core, substantially parallel to the planar surface of the stripe-domain supporting magnetizable films;



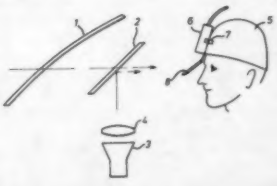
energizing said tickle field coil by an AC drive current signal of significant to decreasing to zero amplitude; and,
concurrently energizing said orienting field coil by a pulsed drive current signal that extends beyond the termination of the AC drive current signal, said energized tickle field coil and orienting field coil inducing in said stripe-domain supporting magnetizable film fields that conjointly establish the inter-domain walls in said film in a radially directed orientation, the separation of which is proportional to the distance from the center of the diffraction grating.

4,398,799

HEAD-UP DISPLAYS

David W. Swift, Prestatyn, Wales, assignor to Pilkington P.E. Limited, St. Helens, United Kingdom

Filed Feb. 24, 1981, Ser. No. 237,694
Claims priority, application United Kingdom, Mar. 4, 1980, 8007204
Int. Cl.³ G02B 27/14, 7/18; G09B 9/08
U.S. Cl. 350—174 **10 Claims**



1. Apparatus for use with a head-up display system by which displayed visual information is superimposed on an observer's view of an outside scene, the apparatus comprising a camera, means for mounting the camera on the head of the observer, light directing means having a reflective area, and means for mounting the light directing means on the head of the observer with said reflective area between the eyes of the observer so as to reflect light to the camera which thereby views both the outside scene and the superimposed displayed information from substantially the same viewing position as the observer.

4,398,800

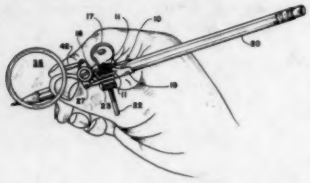
MAGNIFYING DEVICE FOR A HAND-HELD IMPLEMENT

Jess W. Hayes, 9208 Farmington Dr., Richmond, Va. 23229

Filed Mar. 9, 1981, Ser. No. 241,963

Int. Cl.³ G02B *7/02*

U.S. Cl. 350—251 **9 Claims**



1. An adjustable magnifying device for a hand-held implement comprising clamping means having opposed elongated jaws shaped in a manner to enclasp an elongated shaft of uniform cross-section, stabilizing means attached to said clamping means and extending substantially perpendicularly therefrom, balljoint attachment means pivotably held by said stabilizing means, and a magnifying glass suspended from a site in its outer periphery by engagement with said balljoint attachment means in a manner which disposes said magnifying glass above said jaws.

4,398,801

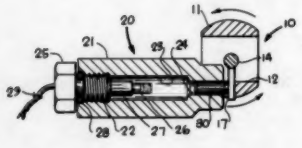
DETONATOR-ACTIVATED BALL SHUTTER

Roy A. McWilliams, and William G. von Holle, both of Livermore, Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 14, 1981, Ser. No. 263,522

Int. Cl.³ G05D *25/00*

U.S. Cl. 350—275 **8 Claims**



1. A shutter mechanism comprising: a rotatable member having an opening therethrough through which light passes, and an explosive-activated means for rotating said member such that light is substantially blocked from passing through said opening, said explosive-activated means including means defining a firing chamber and a barrel, an explosive detonator positioned in said firing chamber, a projectile at least partially positioned in said barrel, whereupon activation of said detonator causes said projectile to be driven through said barrel for rotating said member.

4,398,802

SOLAR MIRROR HAVING CONTIGUOUS REFLECTING PANELS MOUNTED ON A MOVABLE FRAME

Henri Auger, Le Vesinet, and Jean-Pierre Acloque, Meriel, both of France, assignors to Saint Gobain Vitrage, Neuilly-sur-Seine, France

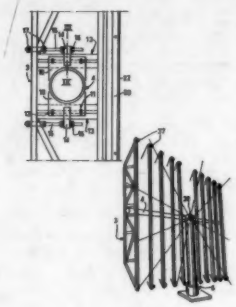
Filed Jul. 15, 1981, Ser. No. 283,468

Claims priority, application France, Jul. 29, 1980, 80 16682

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—292 **7 Claims**

1. A solar mirror having a plurality of contiguous rectangular reflector panels mounted on a rigid frame movable with respect to a fixed base where the frame includes a plurality of precambered sections adapted to engage the long sides of said panels and a plurality of carrying joists in the form of spaced parallel extending members mounting said precambered sections, characterized in that said frame comprises a single bearing girder having a longitudinal axis extending perpendicular



to and supporting said members, in having distance adjustment means for sliding said members in a plane perpendicular to said longitudinal axis, and in having an angular adjustment means for rotating said members in said perpendicular plane with respect to said girder about a pivotal axis of the solar mirror.

4,398,803

LIQUID CRYSTAL DISPLAY ELEMENT

Ludwig Pohl, Darmstadt; Rudolf Eidenschink, Dieburg, both of Fed. Rep. of Germany; Fernando del Pino, Quito, Ecuador, and Georg Weber, Erzhausen, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,271

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022818

Int. Cl.³ G02F *1/137*; C09K *3/34*

U.S. Cl. 350—334 **11 Claims**

1. In a liquid crystal display element based on a twisted nematic cell the improvement wherein the product of the layer thickness and the optical anisotropy of the liquid-crystalline dielectric has a value of 150 to 600 nm.

11. A method of operating a liquid crystal display element based on a twisted nematic cell so that it possesses a lower degree of interference colors and a lower dependence of contrast on viewing angle, comprising, operating the twisted nematic cell element with a dielectric whose layer thickness and optical anisotropy are such that the product of layer thickness and optical anisotropy has a value of 150–600 nm.

4,398,804

LIQUID CRYSTAL DISPLAY UNIT

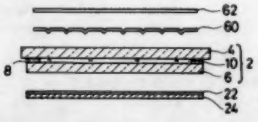
Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Jul. 18, 1980, Ser. No. 170,020

Claims priority, application Japan, Apr. 22, 1980, 55/55798[U]

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—337 **3 Claims**



1. A liquid crystal display unit comprising: a liquid crystal

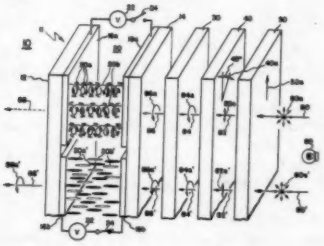
display element (2) comprising a first transparent sheet (4), a second transparent sheet (6) arranged to face said first transparent sheet (4), whereby a gap is formed between the first and second transparent sheets, first electrode means (12) formed on one surface of said first transparent sheet, second electrode means (18) formed on one surface of said second transparent sheet and arranged to face said first electrode means, and liquid crystal means placed in said gap defined between one surface of each of said two transparent sheets; a reflecting sheet (24) disposed relative to the other surface of said second transparent sheet (6); first polarizing sheet means (62) disposed relative to the other surface of said first transparent sheet; second polarizing sheet means (22) located between said second transparent sheet and said reflecting sheet; protective sheet means (60) formed as a transparent resin sheet and located between said first transparent sheet and said first polarizing sheet (62); and first and second clearance means (44, 58) for forming a first clearance between said first transparent sheet (4) and said protective sheet (60) and a second clearance between said first polarizing sheet (62) and said protective sheet (60), said first and second clearance means each comprising a plurality of first and second projections (44, 58) each distributed uniformly in a geometric pattern over each surface of said protective sheet (60), said projections having a predetermined uniform height, and wherein said first and second projections are simultaneously formed by embossing said protective resin sheet (60).

4,398,805

TRANSFLECTIVE LIQUID CRYSTAL DISPLAY

Herbert S. Cole, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,582
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—345 **9 Claims**



1. A display viewable by reflected or transmitted light, comprising:

a liquid crystal display cell having relatively low attenuation of light passing therethrough with any polarization in the activated condition and having substantial attenuation in an unactivated condition, of at least randomly and circularly polarized light of a first handedness sense passing therethrough, said cell having a first surface viewable by an observer and a second surface opposite said first surface;

transflector means adjacent to said cell second surface for reflecting back to said cell a relatively large portion of light impingent thereon from said cell and also for transmitting a relatively lesser portion of light arriving from a direction opposite from the direction of said cell;

means, placed beyond said transflector means with respect to said display cell, for linearly polarizing light in a first direction; and

means, positioned between said transflector and polarizing means, for imparting circular polarization to linearly polarized light arriving from said polarizing means and traveling toward said transflector means; said circularly-polarizing means imparting a twist handedness sense to said light opposite to the first handedness sense in said cell in said unactivated state;

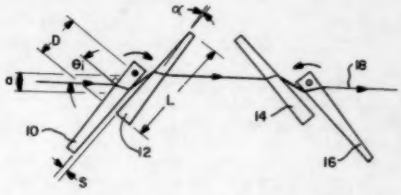
said cell appearing dark in said unactivated condition when light is transmitted or reflected by said display and appearing in a bright condition when light is transmitted or reflected through the display in the activated state.

4,398,806

BROADBAND VARIABLE OPTICAL ATTENUATOR

Keith E. Bennett, Palo Alto, and Robert L. Byer, Stanford, both of Calif., assignors to The Board of Trustees of the Leland University, Palo Alto, Calif.

Filed Oct. 23, 1980, Ser. No. 199,845
Int. Cl.³ G02B *5/30*; G02F *1/01*; B02B *27/14*
U.S. Cl. 350—394 **6 Claims**



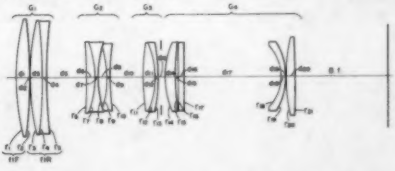
1. An optical variable attenuator comprising first and second wedge shaped plates, each of said plates having two surfaces defined by an angle of convergence, means for rotatably supporting said two plates with two of said surfaces of said plates being in spaced parallel alignment and with the angle of convergence of said two plates being in opposite directions, and means for rotatably positioning said two plates in an optical path with the axis of rotation of said two plates being perpendicular to the axis of said optical path.

4,398,807

ZOOM LENS

Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,086
Claims priority, application Japan, Feb. 26, 1980, 55-22995
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—427 **2 Claims**



1. In a zoom lens consisting of a first positive lens group, a second negative lens group, a third positive lens group and a fourth positive lens group arranged in this order as viewed from the object field side, wherein the first lens group functions as a focusing unit, the second lens group functions as a variator for changing the magnification by moving along the optical axis in a linear fashion, the third lens group functions as a compensator for maintaining at a predetermined position the image plane which is variable with the movement of said second lens group, and the fourth lens group functions as a relay lens, and wherein said first lens group is composed of a front component constitututed by a positive lens and a rear component constituted by a positive lens and a negative lens cemented together with the resulting power being positive and the cemented surface being concave toward the object side,

the improvement being characterized in that said zoom lens satisfies the following conditions:

$$1.3 < \frac{fT}{f1} < 1.6 \quad (1)$$

$$1.2 < \frac{f1}{fW} < 1.4 \quad (2)$$

$$1.26 < \frac{f1F}{f1} < 1.4 \quad (3)$$

$$4.0 < \frac{f1R}{f1} < 5.0 \quad (4)$$

$$0.3 < \frac{r2 + r1}{r2 - r1} < 0.5 \quad (5)$$

$$2.5 < \frac{r5 + r3}{r5 - r3} < 3.0 \quad (6)$$

$$-\frac{1}{1200} < \frac{n3 - n2}{r4} < -\frac{1}{1400} \quad (7)$$

wherein, f1, f2, f3 and f4 are the focal lengths of said first, second, third and fourth lens groups, respectively;

fW is the shortest focal length of the total system offered by zooming;

fT is the longest focal length thereof;

f1F is the focal length of the front component of said first lens group;

f1R is the focal length of the rear component thereof;

r1 and r2 are radii of curvature of the first and second surfaces of said front component, respectively, r4 is the radius of curvature of the cemented surface of said rear component of the first lens group, and r3 and r5 are radii of curvature of the surfaces at the object side and at the image side of said rear component, respectively; and n2 is the refractive index of the positive lens constituting said rear component of the first lens group and n3 is the refractive index of the negative lens constituting said rear component of the first lens group.

4,398,808

COMPACT ZOOM LENS OF HIGH MAGNIFICATION

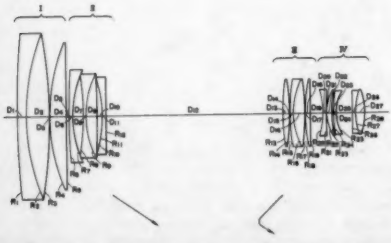
Kazuo Fujibayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,341

Claims priority, application Japan, Jan. 31, 1980, 55-12931

Int. Cl.³ G02B *15/18*

U.S. Cl. 350—427 **3 Claims**



1. A compact zoom lens of high magnification comprising, in succession from the object side, a first lens group having a positive refractive power and having a focusing function, a second lens group having a negative refractive power and movable on the optical axis to effect magnification change and having, in succession from the object side, a negative lens having its concave surface of sharper curvature facing the image side, a negative doublet lens consisting of a biconcave lens and a positive lens, and a negative lens having its concave surface of sharper curvature facing the object side, a third lens group having a positive refractive power and reciprocable on the optical axis to correct the movement of the image plane resulting from the movement of said second lens group, and a fourth lens group having a negative refractive power, said zoom lens satisfying the following conditions:

$0 < Fw/|F_{II2}| < 0.1$, but $F_{II2} < 0$

$0.85 < R_{II4}/Fw < 1.2$

$0.2 < R_{II6}/R_{II5} < 0.6$

where F_{II2} is the focal length of the doublet lens in said second lens group, R_{IIi} is the curvature radius of the ith lens surface in said second lens group, and Fw is the focal length of the wide angle end of the entire system.

4,398,809

HIGH SPEED CATADIOPTRIC SYSTEM

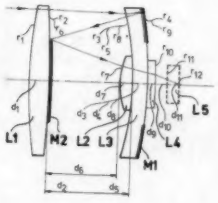
Ludvik Canzek, Quellmattstrasse 3, 5035 Unterentfelden, Switzerland

Filed Jul. 6, 1981, Ser. No. 280,244

Claims priority, application Switzerland, Aug. 16, 1980, 6155/80

Int. Cl.³ G02B *17/08*

U.S. Cl. 350—444 **11 Claims**



1. A high speed catadioptric system comprising in the order of the transmission of a regular light ray:

a first single positive lens (L_1);

a main mirror lens (M_1) with an unsilvered central portion;

a counter mirror (M_2);

a convergent lens system (L_2);

a lens (L_3) consisting of the unsilvered central portion of the main mirror (M_1) and

a divergent lens system (L_4), wherein:

the system consisting of said convergent lens system (L_2), said lens (L_3) and said divergent lens system (L_4) is of positive refractive power, and

said first single positive lens (L_1) and said main mirror lens (M_1) consist of the same type of glass.

4,398,810

FRESNEL LENS SYSTEM

Marvin P. Hodges, St. Petersburg, Fla., and Richard A. Buchroeder, Tucson, Ariz., assignors to B Optical, St. Petersburg, Fla.

Filed Feb. 18, 1982, Ser. No. 350,001

Int. Cl.³ G02B *3/08, 17/00*

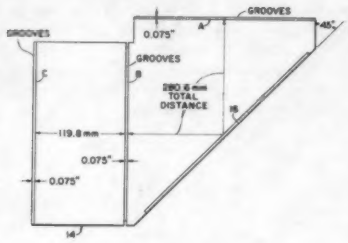
U.S. Cl. 350—452 **11 Claims**

1. A Fresnel lens system having design parameters normalized for a 280 mm focal length represented by the following table:

Element	R	D	E	F	Separation
A	−364.848 mm	$+0.779 \times 10^{-8}mm^{-3}$	$-0.1990 \times 10^{-12}mm^{-5}$	$+0.2300 \times 10^{-17}mm^{-7}$	280.6mm (nominal)
B	−269.834	$+0.3539 \times$	$-0.118 \times$	$+0.5003 \times$	

-continued

Element	R	D	E	F	Separation
	mm	$10^{-7}mm^{-3}$	$10^{-11}mm^{-5}$	$10^{-16}mm^{-7}$	
					119.8mm (nominal)
C	−142.473 mm	+0.1322 × $10^{-7}mm^{-3}$	−0.6375 × $10^{-9}mm^{-5}$	+0.4502 × $10^{-17}mm^{-7}$	



wherein letters A through C identify the respective lens elements from the screen side to the cathode ray tube side and R, D, E, and F are constants of the following generating function:

$$x=y^2/2R+Dy^4+Ey^6+Fy^8$$

where y is the zonal ray distance from the optical axis, and wherein and the slope of the generating function given as a tangent, is defined as:

$$\tan\theta=y/R+4Dy^3+6Ey^5+8Fy^7$$

with all dimensions being expressed in millimeters, and wherein the design parameters may be normalized to any other focal length, lengths and lens materials.

4,398,811

VIEWING-DIRECTION CHANGING OPTICAL SYSTEM

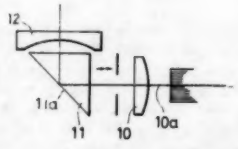
Kimihiko Nishioka, and Nobuo Yamashita, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 166,693, Jul. 2, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,664

Claims priority, application Japan, Jul. 6, 1979, 54-85654

Int. Cl.³ G02B *23/02*; A61B *1/00*

U.S. Cl. 350—506 **8 Claims**



1. In an endoscope, a viewing-direction changing optical system comprising at least one reflecting means arranged for the purpose of deflecting the optical axis to a direction different from the axis of said endoscope, a first lens group arranged on the object side of said reflecting means, and a second lens group arranged on the image side of said reflecting means, said viewing-direction changing optical system being arranged to relatively displace the optical axis of said first lens group and optical axis of said second lens group, the optical axis of said endoscope from said reflecting means to said first lens group being adapted to still extend through said first lens group when said reflecting means and first lens group are relatively displaced.

4,398,812

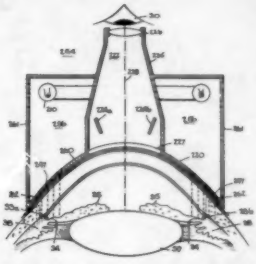
APPARATUS AND METHOD FOR MEASURING THE ANTERIOR CHAMBER DIAMETER OF THE EYE

Charles D. Kelman, 73 Bacon Rd., Old Westbury, N.Y. 11568

Filed Jun. 18, 1980, Ser. No. 160,911

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—205 **14 Claims**



1. In an ocular apparatus having a goneal assembly positionable proximate to the anterior surface of the cornea for viewing the presence of light, at first and second opposite end points of a diameter of the annular groove, said goneal assembly having a goneal housing and a longitudinal axis approximately coinciding with the optic axis when said assembly is in an operable position, said optic axis passing approximately through the midpoint of said diameter, said annular groove being formed by the anterior surface of the iris and the posterior surface of the cornea, the annular groove being bounded by a light-impervious ciliary body outwardly of the groove with respect to the optical axis of the eye, the improvement comprising:

light means cooperative with said goneal assembly for directing light toward the eye;

flange means including first and second flange portions extending laterally from said goneal housing so as to be anterior and proximate to the corneal surface of the eye and at first and second opposte sides of said optic axis, respectively, when said goneal assembly is in an operable position; and

color means cooperating with said flange means for transmitting light beams onto the surface of the eye in the form of a first and second series of lines of light at opposite sides of the optic axis, each line of light being of a different color than and adjacent to other lines of light in the same series, said lines of light being spaced at predetermined distances from one another and adapted to illuminate said first and second end points with first and second colored lines of light from said first and second series, respectively, when the light is directed through said color means in regions corresponding to the annular groove and in regions corresponding to said light-impervious ciliary body, the colors of said first and second lines illuminating said first and second end points being visible through said goneal assembly whereby said anterior chamber diameter is determinable from the color of said first and second colored lines and corresponds to the predetermined distance therebetween.

4,398,813
PHOTOGRAPHIC CAMERA

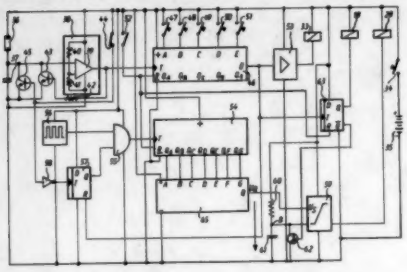
Eduard Wagensonner, Aschheim; Karl Wagner, Munich, and Bernhard von Fischern, Ottobrunn, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,016

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036678

Int. Cl.³ G03B *7/097*

U.S. Cl. 354—23 D **26 Claims**



1. A photographic camera having an aperture diaphragm, a shutter control means and a diaphragm setting device, said diaphragm setting device comprising a light-sensitive circuit generating pulses; an electromagnetic diaphragm setting stage; a diaphragm counting stage connected to the light-sensitive circuit for comparing signals from the light-sensitive circuit with preset signals and for providing a stop pulse to the electromagnetic diaphragm setting stage; a pulse generator; a time counter connected via a stop control connection to the pulse generator and to the diaphragm counting stage; and said shutter control means comprising an exposure time forming stage connected via a start control connection to the output of the diaphragm counting stage.

4,398,814
CASSETTE FOR HOLDING AND DISPENSING A ROLL OF WEB MATERIAL

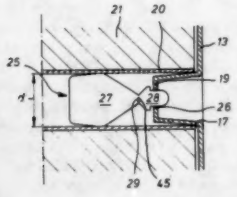
Wilfried E. Muylle, Schoten, and Edward Buelens, Kontich, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Dec. 8, 1981, Ser. No. 328,627

Claims priority, application United Kingdom, Jun. 23, 1981, 8119360

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 **7 Claims**



1. A cassette for holding and dispensing a roll of web material wound onto a tubelike core, said cassette comprising a container formed of a tubular shell and two fixed end walls having central hub portions, a tubelike core having a roll of web material wound thereon for rotation therewith, said core having rotatably supported within said container by said hub portions, the shell having a peripheral exit slot through which the web material can be unrolled from said roll, and a rigid locking member for preventing rotation of the core prior to the first use of the cassette, such member comprising two end portions connected by a weakened zone which is ruptured by the rotation of the core incidental to the initial withdrawal of the web material from the cassette, one of said end portions of said locking member being located within and engaged by the core of the roll, and the other end portion being engaged with the hub portion of one end wall of said container so as thereby to prevent rotation of the core, said weakened zone having across its width at least one inner sub-zone of substantially lower rupture resistance than the rupture resistance in each of the outer sub-zones on each side of said inner sub-zone, whereby the rupture resistance of said weakened zone varies across its width and said weakened zone ruptures with significantly lesser relative rotation between said core and hub than in the absence of said inner sub-zone.

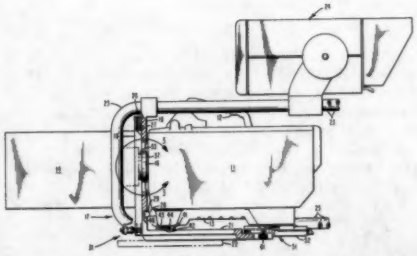
4,398,815
CAMERA MOUNT

Verl N. Barzee, Sunnyvale, and Peter J. Wonfor, Cupertino, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 313,069, Oct. 19, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 405,988

Int. Cl.³ G03B *17/56*

U.S. Cl. 354—293 **4 Claims**



1. A camera mount of the type including a front plate for attaching a camera-lens assembly, the front portion of said camera having an attachment to said lens in the vicinity of said plate for supporting said front camera portion, and a bottom plate extending rearwardly, parallel to the lens axis, from the lower portion of the front plate for supporting the rearward portion of the camera and for mounting the camera on a base structure, characterized in that:

means are provided on said bottom plate for engaging and supporting said rearward portion of said camera and for countering the moment exerted by the weight of the camera about said attachment thereof

said supporting means includes an adjustable pressurizing means that is automatically self-limiting for exerting a predetermined maximum supporting force upwardly on said camera to counter said moment; and

means are provided for clamping said camera and lens assembly to said bottom plate and to said supporting means thereof.

4,398,816

ELECTROPHOTOGRAPHIC COPYING PRINTER

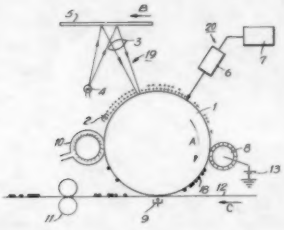
Junzo Nakajima, Kawasaki; Masatoshi Kimura, and Tadashi Matsuda, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 65,869, Aug. 13, 1979, abandoned. This application Sep. 4, 1981, Ser. No. 299,793

Claims priority, application Japan, Aug. 18, 1978, 53-99949

Int. Cl.³ G03G *15/01, 15/04, 15/28*

U.S. Cl. 355—3 R 9 Claims



1. An electrophotographic copying printer having a homogeneously charged recording medium surface, said copying printer comprising first and second optical latent image forming devices for forming an electrostatic latent image directly on said recording medium surface, each of said first and second optical latent image forming devices having the capability of discharging almost half the initial charges of said recording medium and the discharging effect of said first and second optical latent image forming devices forming the combined electrostatic latent image, said first optical latent image forming device discharging almost half said recording medium having the initial capability of the background, except for the image portion to be formed by said first optical latent image forming device in order to form a latent image on said homogeneously charged recording medium surface and said second optical latent image forming device discharging almost half said recording medium having the initial capability of the background, except for the image portion to be formed by said second optical latent image forming device in order to form a latent image on the latent image formed on said recording medium surface by said first optical latent image forming device.

4,398,817

MAGNETIC DEVELOPER APPARATUS FOR APPLYING TWO DIFFERENT COLORED TONERS WITH THE SAME APPLICATOR

Fuminobu Nishimura, Yokohama, and Mitsuaki Kohyama, Higashi-kurume, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1982, Ser. No. 361,101

Claims priority, application Japan, Mar. 25, 1981, 56/42020[U]

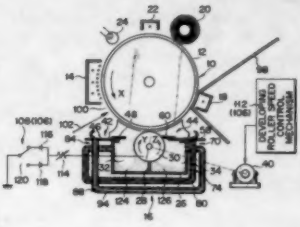
Int. Cl.³ G03G *15/01*

U.S. Cl. 355—4 14 Claims

1. A copying apparatus comprising:

a photosensitive body; and

a developing device which includes a first storage chamber for storing a first developer, a second storage chamber adjacent to the first storage chamber for storing a second developer, and a developing roller having an outer peripheral surface consisting of a first portion facing said photosensitive body, a second portion located inside the first storage chamber, and a third portion located inside the second storage chamber, and rotatable in one direction and in the other direction opposite thereto so that the first developer is supplied from the first storage chamber to said photosensitive body when the developing roller rotates in said one direction, and that the second developer is supplied from the second storage chamber to said photosensitive body when the developing roller rotates in said other direction.



4,398,818

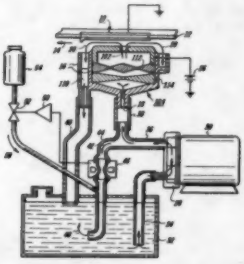
LIQUID TONER FOUNTAIN FOR THE DEVELOPMENT OF ELECTROSTATIC IMAGES

Lothar S. Jeromin, Sierra Madre, and Wayne L. Kahler, Manhattan Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1980, Ser. No. 193,855

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 10 Claims



1. In an apparatus wherein a latent image is formed on an insulating member and wherein a device is incorporated for developing said image, the improvement comprising:

a member for bearing a latent image thereon,

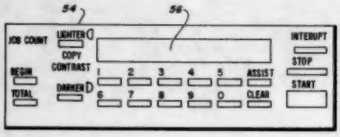
means disposed in an opposed relationship to said image bearing member for applying developer thereto, said applying means comprising a housing for receiving developer, a first plate member supported within said housing and having a plurality of holes formed thereon, a second plate member supported in said housing above said first plate member and having a plurality of holes formed thereon, and a development electrode positioned above said second plate member and having an elongated slot formed thereon, a voltage source connected to said development electrode, and

means for supplying developer into the bottom of said housing, the developer being directed upward, passing through the holes formed in said first and second plates which equalizes the upward flow across the length and width of said housing, then passing through the space between said second plate and said electrode which is large enough in a vertical direction to allow the turbulence of the developer to be minimized, and thereafter out of said slot to produce a smooth laminar flow in the form of a standing wave over said electrode and toward said latent image whereby said latent image is developed.

4,398,819
COMBINATION SCROLL AND MARQUEE DISPLAY

Steven M. Schron, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1982, Ser. No. 344,086
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 R 13 Claims



1. In a reproduction machine for producing impressions of an original, the combination of

a photosensitive member,

a plurality of discrete operating components cooperable with one another and a photosensitive member to electrostatically produce the impressions on support material,

an operator console having an alphanumeric display,

a controller including a memory electronically storing the characters for providing messages,

means to display the messages in either a scroll or marquee manner on the alphanumeric display,

means to select a particular message for display,

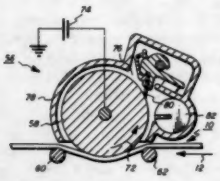
identification means to determine the manner of display of the particular selected message, and

means to display the particular message in response to the identification means.

4,398,820
CLEANING SYSTEM

Bruce E. Thayer, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1981, Ser. No. 264,485
Int. Cl.³ G03G 21/00
U.S. Cl. 355—15 18 Claims



1. An electrophotographic printing machine of the type having residual toner particles adhering to a photoconductive member, wherein the improvement includes:

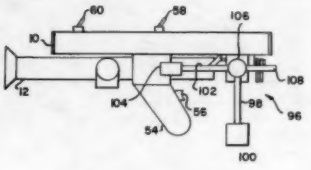
electrically conductive means, in resilient engagement with the photoconductive member to define an extended cleaning region therebetween, for transporting the toner particles away from the photoconductive member; and

means for electrically biasing said transporting means to attract the toner particles from the photoconductive member to said transporting means in the extended cleaning region.

4,398,821
INSTRUMENT FOR MEASURING ANGLES

Erle R. Steward, 21 Medway Rd., Cape Town, South Africa 7800

Filed Oct. 14, 1980, Ser. No. 196,828
Claims priority, application South Africa, Oct. 15, 1979, 79/5496
Int. Cl.³ G01B 11/26
U.S. Cl. 356—152 5 Claims

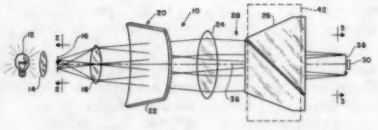


1. A navigational instrument for determining the angle of elevation of the sun, the instrument comprising a rotatable structure including means for producing a reference signal each time that a specific part of the rotatable structure passes a reference point; photo-sensitive means for generating an indicator signal when light from the sun falls on it; image-forming means, forming part of said rotatable structure, for causing a succession of images of the sun to fall onto the photo-sensitive means, thus causing a succession of indicator signals to be generated by said photo-sensitive means; means for detecting the time interval between an indicator signal and a reference signal and for generating a signal proportional to said interval; a telescope through which the horizon and the image produced by said image-forming means can be viewed to enable a user to place the axis of the telescope, the sun and the point on the horizon at which he is looking in the same vertical plane; and manually operable switch means for causing said signal proportional to said time interval to be generated.

4,398,822
TWO-AXIS ANGULAR DEVIATION MEASUREMENT SYSTEM WITH TARGET IMAGE ROTATING MEANS

Harry L. Task, 5513 Snowbank Cir., Dayton, Ohio 45431

Filed Dec. 3, 1981, Ser. No. 327,301
Int. Cl.³ G01N 21/88
U.S. Cl. 356—239 4 Claims



1. In a system for measuring angular deviation in a transparency, said system having a predetermined optical axis and including an opaque object having a transparent pattern formed therein by a pair of transversely-aligned segments, an incoherent light source for illuminating said object, and means for projecting an image of said transversely-aligned segments through a test region of space, the improvement which comprises:

(a) means for receiving said projected image and for transmitting it, after having removed any effects of lateral displacement of the image, into a predetermined channel;

(b) a linear detector array aligned with said optical axis and positioned in said predetermined channel for detecting a lateral shift in the position of the image of one of said transparent pattern segments due to angular deviation for a particular point on said transparency, the lateral shift

occurring, if at all, when the transparency is inserted into the test area; and

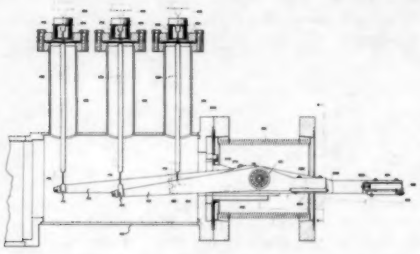
(c) said receiving means including means actuatable for rotating the image of said transparent pattern segments about said optical axis to dispose the image relative to said array such that any lateral shifts in the position of, first, the image of one and, then, the image of the other of said segments are detected successively by said array.

4,398,823

EXTENDED RANGE MONOCHROMATOR

Frederick C. Brown, Champaign, Ill., and Neil C. Lien, Evansville, Wis., assignors to Baker Manufacturing Company, Evansville, Wis.

Filed Jun. 1, 1981, Ser. No. 268,838
Int. Cl.³ G01J *3/18*
U.S. Cl. 356—334 **13 Claims**



10. In a monochromator utilizing Rowland circle optics including an entrance slit, a grating, and an exit slit, and adapted for operation in a vacuum, the improvement comprising

a movable optical carriage carrying the entrance slit and the grating with the exit slit remaining fixed;

linear positioning means remotely electrically controllable to linearly position the optical carriage;

a rotatable entrance slit mounting carrying the entrance slit;

a grating arm carrying the grating thereon, the grating arm being rotatably mounted on the rotatable entrance slit mounting so that the entrance slit and the grating arm are rotatable about the same axis; and

independent rotational positioning means for each of the entrance slit mounting and the grating arm, the rotational positioning means being remotely electrically controllable so that a selectable frequency of radiation can be directed through the exit slit by appropriate linear and rotational positioning of the entrance slit mounting and the grating arm.

4,398,824

WAFER TILT COMPENSATION IN ZONE PLATE ALIGNMENT SYSTEM

Martin Feldman; Alan D. White, both of Berkeley Heights, and Donald L. White, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 15, 1981, Ser. No. 254,486
Int. Cl.³ G01B *11/27*
U.S. Cl. 356—401 **11 Claims**

1. An apparatus for aligning a semiconductor wafer of the type that includes, on a surface portion of the wafer, image forming means that when illuminated by incident radiation forms at least a first focused image located a first prescribed distance from said surface and a second focused image located a second prescribed distance from said surface;

said apparatus comprising:

means for directing incident radiation onto said image forming means to form said first and second focused images;

position sensing means;

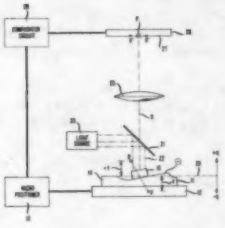
means for projecting said first and second focused images onto said position sensing means to form first and second projected images;

means, responsive to said position sensing means, for moving said wafer,

said position sensing means being adapted to determine when said first and second projected images are displaced from positions, preselected for each of said projected images, by amounts proportional to said first and second prescribed distances respectively;

said moving means being adapted to move said wafer so that said first and second projected images are displaced from said positions, preselected for each of said projected images, by amounts proportional to said first and second prescribed distances, respectively;

wherein said first and second focused images are real and virtual images respectively;



said real image being located a first prescribed distance in front of said wafer surface and said virtual image being located a second prescribed distance behind said wafer surface;

wherein said position sensing means comprises:

at least one photodetector means adapted to generate electronic signals in response to said projected images; and

comparator circuit means, operative in response to said signals, for electronically determining when said first and second projected images are displaced from said positions, preselected for each of said projected images, by amounts proportional to said first and second prescribed distances respectively; and

wherein said position sensing means comprises a single photodetector means onto which said real and virtual images are projected to form said first and second projected images;

the same position on said single detector means being preselected for each of said projected images.

4,398,825

OPTICAL SCANNER FOR BALL INSPECTION

Robert W. Lewis, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

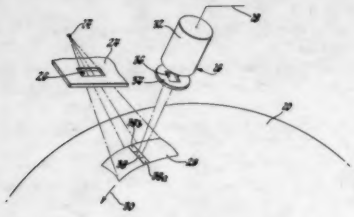
Filed Feb. 17, 1981, Ser. No. 234,776
Int. Cl.³ G01N *21/89*
U.S. Cl. 356—426 **4 Claims**

1. An optical scanner for optically inspecting the surface of balls comprising;

means for spinning a ball to be inspected, a semicircular array of substantially equal intensity light sources for illuminating the ball surface, each light source being directional to illuminate a restricted zone of the ball,

a semicircular array of light detectors adjacent the array of sources, each detector being positioned to sense the light specularly reflected from several discrete surface areas proximate the detector and originating from several light sources adjacent the detector, whereby substantially no

light from remote zones of the ball reaches the said detector, and



a plurality of electronic detector channels, one for each light detector, for analyzing changes in received light to determine the presence of a ball surface defect.

4,398,826

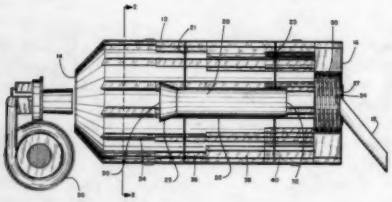
ASPHALTIC CONCRETE RECYCLING APPARATUS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 139,640, Apr. 14, 1980, Pat. No. 4,326,809, and a continuation-in-part of Ser. No. 180,297, Aug. 22, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,284

Int. Cl.³ B28C *5/42, 5/46*

U.S. Cl. 366—25 **10 Claims**



1. An elongated rotatable drum having an open inlet port at a first drum end for introducing composition therein, a burner adjacent said first end for introducing hot gases of combustion into said inlet port, a recovery port adjacent a second drum end, closure means for closing said recovery port except to the extent necessary for recovering composition therefrom, and an elongated sleeve entirely within said drum and extending along the drum length intermediate said first and second drum ends for directing a portion of said hot gases toward said second drum end.

4,398,827

SWIRL MIXING DEVICE

David E. Dietrich, 8450-101 Via Sonoma, La Jolla, Calif. 92037

Filed Nov. 10, 1980, Ser. No. 205,147

Int. Cl.³ B01F *13/02*

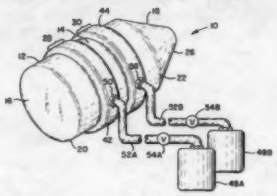
U.S. Cl. 366—107 **19 Claims**

1. A mixing device comprising:

(a) a container with a bottom and an exhaust;

(b) first means formed in said container wall for symetrically injecting a first fluid reagent into said container with a given angular momentum, said first means including means for injecting such first reagent at a first predetermined tangent circle, said first tangent circle having a radius smaller than the radius of the container;

(c) second means formed in said container wall spaced from said first means, for symmetrically injecting a second reagent into said container with an angular momentum opposite that of said first reagent, said second means including means for injecting said second reagent at a second predetermined tangent circle, said second tangent circle having a radius smaller than the radius of the container and different from the radius of said first tangent circle; and



(d) said first means and said second means being adapted such that the total angular momentum injection rate, summed overall injected reagents, is smaller than the angular momentum injection rate of any given injected reagent.

4,398,828

PNEUMATIC MIXING SILO

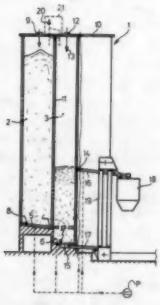
Wolfgang Kluger, Beckum, and Heinz Huser, Ahlen, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,498

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 3002030

Int. Cl.³ B01F *13/02*; B65G *53/40*

U.S. Cl. 366—107 **11 Claims**

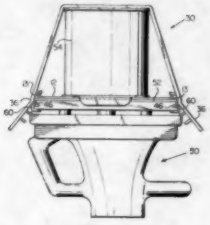


1. A pneumatic mixing silo comprising an upright wall and a base forming a storage compartment for materials to be mixed; means for introducing materials to be mixed into said storage compartment adjacent its upper end; an annular wall spaced from and encircled by said upright wall and having a bottom at a level below that of said base, said annular wall and said bottom forming a mixing compartment; means for aerating said base and said bottom; a plurality of throughflow openings in said annular wall at the level of said base of said storage compartment and through which materials from said storage compartment may pass into said mixing compartment; at least one material overflow outlet in said mixing compartment at a level above that of said throughflow openings; and discharge conveyor means communicating with said overflow outlet for transporting material discharged therefrom from said silo.

4,398,829
CAN SHAKER KIT FOR ATTACHMENT TO A VIBRATING POWER SANDER

Jack N. Shick, 766 Main St., Newington, Conn. 06111

Filed Jul. 9, 1981, Ser. No. 281,790
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—110 2 Claims

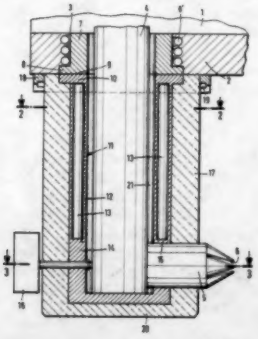


1. A can shaker kit for attachment to the rectangular sanding base of an inverted vibratory sander, which base has clamping means at the opposite shorter sides thereof, said kit comprising a rectangular plate having depending side flanges abutting the longer sides of the sander base to prevent movement of the plate laterally, said plate having raised ribs so positioned as to locate cans to be shaken in centered relationship and in upright condition on said plate, said plate having upturned ends along its shorter sides, an elastomeric strap of elongated rectangular shape with ends of approximately the same width as said plate shorter sides, said strap having ribs integrally formed in said strap and corresponding to those in said plate and having integrally formed longitudinally spaced laterally extending flanges selected pairs of which are adapted to be received by said clamping means to secure cans of various height between said strap and said plate for shaking as a result of longitudinally stretching said strap so that it biases a can toward said plate and so that portions of said strap adjacent said clamp strap flanges abut said upturned ends of said plate to restrict said plate from movement longitudinally of said sandere base.

4,398,830
APPARATUS FOR DISCHARGING FOAMED MATERIAL, SUCH AS WHIPPED CREAM

Helmut Koerfer, Camberg-Erbach, Fed. Rep. of Germany, assignor to F. Vaihinger GmbH & Co. Kommanditgesellschaft, Rodgau, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,491
Claims priority, application Austria, Jun. 24, 1981, 2810/81
Int. Cl.³ B01F *15/06*
U.S. Cl. 366—144 5 Claims

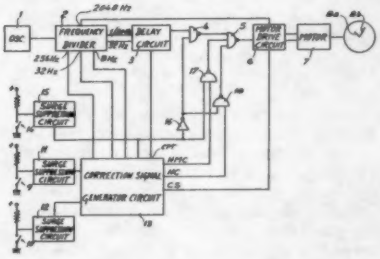


1. An apparatus for discharging a foamed material, such as whipped cream from a device holding or producing the whipped cream, comprising housing means for said device, outlet port means extending through a wall of said housing means, refrigeration means (8') for cooling said housing means, foamed material discharge nozzle means, heat conducting tubular jacket means mounting said discharge nozzle means to said housing means for supplying foamed material through said outlet port means to the discharge nozzle means, said heat conducting tubular jacket means comprising a hollow jacket portion (12) forming a chamber holding a cooling liquid, and a solid jacket portion (14) mounting said discharge nozzle means, said hollow jacket portion being in cooling heat transfer contact with said refrigeration means, said hollow jacket portion being further in cooling heat transfer contact through said solid jacket portion with said discharge nozzle means so that the discharge nozzle means (5) is cooled by cold stored in said cooling liquid which thereby changes its physical state when said refrigeration means are temporarily inoperative.

4,398,831
ELECTRONIC WATCH

Jean-Claude Fatton, Le Landeron; Jean-Pierre Calame, La Chaux-de-Fonds, and Claude Mutrux, Cernier, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Feb. 25, 1982, Ser. No. 352,380
Claims priority, application Switzerland, Mar. 5, 1981, 1463/81
Int. Cl.³ 368 *189;* G04C *17/00, 9/00;* G04B *19/24*
U.S. Cl. 368—76 8 Claims

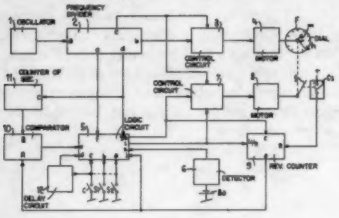


1. An electronic watch comprising a time base for producing a standard frequency signal, a frequency divider circuit connected to the time base for producing a low-frequency time pulse signal, time information display means capable of indicating at least hours and minutes in response to said time pulse signal and a circuit for correcting the display, controlled by a rotary manual control member capable of occupying at least two axial positions, one being a rest position which is occupied by said manual control member when the watch is functioning normally and the other being an operative position serving jointly to correct the display of minutes and the display of hours, said correction circuit being arranged to perform a correction of the display of hours alone in response to a particular predetermined rotary movement of said manual control member in its rest position.

4,398,832
MULTIFUNCTION TIMEPIECE

Aurele Maire, La Chaux-de-Fonds; Jean-Georges Michel, Neuchatel, and Jean-Claude Robert-Grandpierre, Colombier, all of Switzerland, assignors to Compagnie des Montres Longines Francillon SA, Saint-Imier, Switzerland

Filed Feb. 10, 1982, Ser. No. 347,576
Claims priority, application Switzerland, Feb. 16, 1981, 994/81
Int. Cl.³ G04B 19/00
U.S. Cl. 368—76 12 Claims



1. A multifunction timepiece having selectable functions comprising:

a dial;

a first motor driving a seconds hand, said seconds hand being capable of performing displacements and movements for identifying selected functions on the dial;

a second motor driving other display elements;

means for generating time base signals;

electronic circuits for delivering the time base signals and control signals to said first and second motors, said second motor being directly controllable by said control signals;

control elements for selecting the functions of the timepiece;

first means for producing data representative of the position of the seconds hand on the dial;

comparator means connected to said first means for producing data, the comparator means being capable of indicating equality between said data and a value of reference;

memory means connected to said control elements and to said comparator means, for producing data concerning desired displacements and movements of said seconds hand in dependence on the selected functions of the timepiece; and

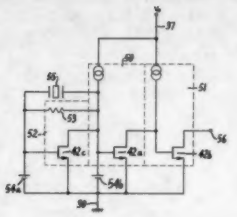
logic means connected to the electronic circuits and receiving data from said memory means, for producing respective control signals of the first motor and of the means for producing data representative of the position of the seconds hand, such that the control signal produced in response to said time base signals cause said first motor and the seconds hand driven thereby to perform said displacements and movements for identifying said selected functions.

4,398,833
ELECTRONIC TIMEPIECE

Kojiro Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 876,202, Feb. 9, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 176,502
Claims priority, application Japan, Feb. 22, 1977, 52-18415
Int. Cl.³ G04F 5/07
U.S. Cl. 368—156 18 Claims

1. In an electronic timepiece including a semiconductor integrated timepiece circuit, the improvement comprising: said timepiece circuit having a stacked logic level circuit structure comprising static induction transistor logic, said stacked logic level circuit structure including at least two static induction transistor inverter circuits which each operate at less than 0.5 volts and which are connected in series; and an electric power

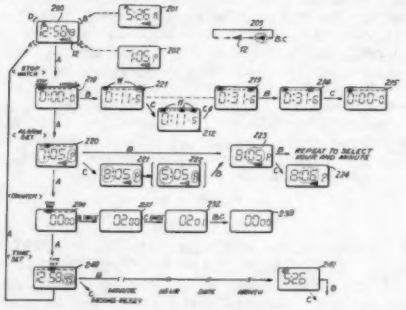


cell having a nominal voltage of 1.5 volts connected for applying the nominal 1.5 volts to power said timepiece circuit.

4,398,834
ELECTRONIC WATCH WITH DEMONSTRATION DISPLAY MODE

Youichi Wakai, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 158,752, Jun. 12, 1980. This application Jan. 28, 1982, Ser. No. 344,121
Claims priority, application Japan, Jun. 12, 1979, 54-73733
Int. Cl.³ G04B 19/00, 25/00
U.S. Cl. 368—223 7 Claims



1. In an electronic watch having a display unit, means for driving said display unit, and external members, said watch being capable of operation to perform and display a plurality of functions, said performance and display being independently initiated by selective actuation of said external members, the improvement therein comprising:

circuit means for automatically demonstrating by simulation in a sequence at least a portion of said plurality of functions, said simulated demonstrated functions being displayed by said display unit.

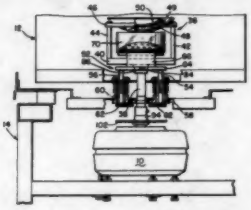
4,398,835
METHOD AND APPARATUS FOR ANALYSIS OF MEAT PRODUCTS

Stuart E. Athey, and Dick P. McCord, both of Troy, Ohio, assignors to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 80,802, Oct. 1, 1979, Pat. No. 4,299,115. This application Jun. 8, 1981, Ser. No. 271,891
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ G01N 5/04, 25/00
U.S. Cl. 374—14 7 Claims

1. In a method of controlling the duration of application of microwave heating energy to a sample of food material con-

taining fat which is heat releasable in liquid form in order to obtain a relatively constant chemical analysis of the residue of said sample, said method including the steps of (a) locating said sample in a perforate holder on a weighing platform of a weighing device, (b) applying microwave energy to said sample to heat the same and cause fat in said sample to be rendered as a liquid, (c) monitoring the weight change of said sample during the applying of said energy thereto, and (d) terminating the applying of energy to said sample when the time rate of



change of the weight of said sample reaches a predetermined rate, the improvement comprising:

collecting said fat rendered from said sample as liquid in a container which is supported independently of said weighing platform of said weighing device during said applying of energy to said sample and said monitoring of the weight loss of said sample to minimize the spattering effect of the rendered fat from adversely affecting the weighing operation and monitoring of weight change of said sample.

4,398,836

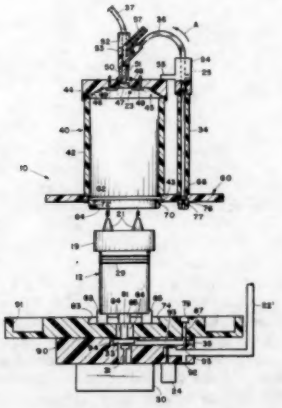
CALORIMETER

George J. Sitek, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Mar. 2, 1981, Ser. No. 239,675

Int. Cl.³ G01K *17/00*; G01N *25/16*

U.S. Cl. 374—38 **25 Claims**



1. A calorimeter vessel for receiving a sample holding calorimeter bomb comprising:

base means defining a support for a calorimeter bomb including means for supplying water therethrough at a first flow rate;

a container having sidewalls and being substantially enclosed at one end and open at an opposite end, said open end of said container sealably engagable with said base means with said sidewalls circumscribing said water supply means;

means for moving said container with respect to said base means for opening and closing said vessel defined thereby; and

conduit means coupled to said container at an end remote from said open end to provide a second lower flow rate of water to said vessel.

4,398,837

PRINTING APPARATUS AND METHOD FOR PREVENTING PRINTING ERRORS IN SAME

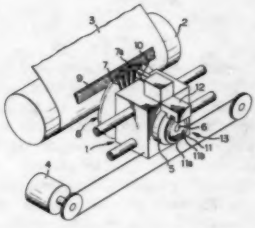
Hiroshi Torii, and Masaharu Mori, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 23, 1982, Ser. No. 361,063

Claims priority, application Japan, Mar. 31, 1981, 56-47751

Int. Cl.³ B41J *1/30, 7/96*

U.S. Cl. 400—74 **14 Claims**



1. A printing apparatus comprising:

a printing mechanism having

a platen for supporting and feeding a sheet of print paper, carriage means,

carriage driving means coupled to said carriage means for moving same along a print line defined on the print paper, and

a print head assembly mounted on the carriage means and including a print wheel, a motor driving said print wheel and a print hammer, said print wheel having a plurality of type elements and being connected a rotary shaft of said print wheel driving motor:

a detecting unit generating angular position signals and a home position signal representative of angular positions and a home position of said print wheel, respectively; and

a control unit including

wheel rotation controlling means, responsive to printing signals representative of said type elements, for controlling said print wheel driving motor to operate to rotate said print wheel so that one of said type elements designated by any of said printing signals is brought to a fixed printing position of said print wheel,

detecting means for detecting an unexpected rotation of said print wheel which is not a result of actuation of said print wheel driving motor, said detecting means generating a warning signal when said unexpected rotation is detected, and

wheel resetting means for resetting, in response to said warning signal, said print wheel to said home position when a first one of said printing signals is received after generation of said warning signal, and before said print wheel is controlled, by said wheel rotation controlling means, to rotate for a normal printing action in response to said first printing signal.

4,398,838

TYPEWRITER RIBBON LIFTING AND TRANSPORTING DEVICE

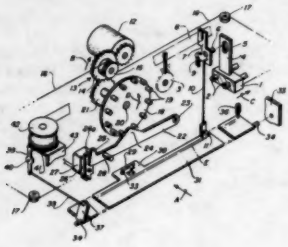
Friedrich Teichmann, Feucht, Fed. Rep. of Germany, assignor to Triumph-Adler A.G. fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,328

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036337

Int. Cl.³ B41J *35/10*

U.S. Cl. 400—212 **5 Claims**



1. In a typewriter having a carriage mounted for movement in escapement and carriage return directions,

a carriage drive, and

means coupled to said motor for driving said carriage in escapement direction upon energization of said motor incident to each character print action,

ribbon guide means movable from a lowered position to an elevated position and from its elevated position to said lowered position incident to each character print action,

spring powered means coupled to said ribbon guide means operable when released from a latched position to move said ribbon guide means from its lowered position to its elevated position,

latching means releasably holding said spring powered means in a latched position,

an electromagnet momentarily energizable incident to each print action for releasing said latch means, and

restoring means coupled to said motor for restoring said released spring powered means to latched position upon energization of said motor incident to a print action.

4,398,839

DEPTH DISPLACEMENT SQUEEGEE WITH LOADING DEVICE

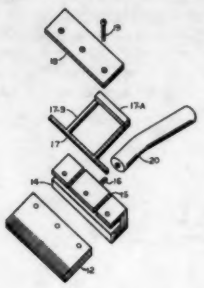
Robert S. Kluck, 14681 Pepper Tree Cir., Tustin, Calif. 92680

Filed Apr. 17, 1981, Ser. No. 255,060

Int. Cl.³ A47L *13/30*

U.S. Cl. 401—263 **5 Claims**

1. An applicator for applying a viscous medium to a surface, said applicator comprising, in combination, (a) a squeegee blade, the working edge of which bears a plurality of closely-spaced slits perpendicular to the plane of said blade; (b) a relatively rigid body member receiving the non-working edge of said blade; and (c) a bar mounted on said body member and bearing against and extending across the upper surface of said



blade, said bar being capable of being moved toward the working edge of said blade.

4,398,840

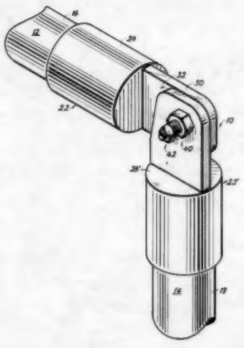
FRAME CONNECTION ASSEMBLY FOR A FENCE GATE

Errol J. French, P. O. Box 1314, Chattanooga, Tenn. 37401

Filed Dec. 29, 1980, Ser. No. 221,010

Int. Cl.³ F16C *11/00*; F16D *1/12*

U.S. Cl. 403—98 **7 Claims**



1. A frame member connection assembly for a fence gate having a pair of substantially horizontally disposed frame members each of said horizontally disposed frame members having opposite end portions, and a pair of substantially vertically disposed frame members each of said vertically disposed frame members having opposite end portions, said frame member connection assembly comprising:

a first bracket including a receptacle having a sidewall and an endwall for receiving said end of said frame members, and a connector member having a first end, a further end, and a planar mating surface extending between said first and further ends, said first end attached to said endwall of said receptacle at a selected position whereby said mating surface extends along an extension of an axis of said receptacle, said connector member being provided with a first and a further opening therethrough substantially perpendicular to said mating surface, said first opening positioned at a first selected location toward said first end of said connector member on one side of said extension of said axis of said receptacle, and said further opening positioned at a second selected location toward said further end of said connector member on an opposite side of said extension of said axis of said receptacle;

a further bracket including a receptacle having a side wall and an end wall for receiving said end of said frame members, and a connector member having a first end, a further end and a planar mating surface extending between said first and further end, said first end attached to said end wal of said receptacle at a selected position whereby said mating surface extends along an extension of an axis of said receptacle, said connector member being provided with a first and a further opening therethrough substantially perpendicular to said mating surface, said first opening positioned at a first selected location toward said first end of said connector member on one side of said extention of said axis of said receptacle and said further opening positioned at a second selected location toward said further end of said connector member on an opposite side of said extension of said axis of said receptacle, said first and said further openings of said further bracket being symmetrically positioned with respect to said first and said further openings of said first bracket;

first securing means passing through said first openings of said first and said further brackets; and

further securing means passing through said further openings of said first and said further brackets.

4,398,841

COLUMN-TO-BEAM CONNECTOR

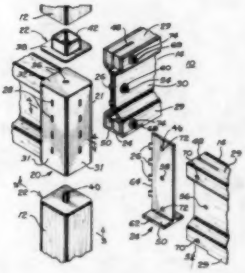
Hajime Kojima, Hirakatashi; Yukio Kurita, Neyagawashi; Kazuhiko Hirata; Satoshi Nakagawa, both of Hirakatashi, and Takahira Ueoka, Kadomashi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 27, 1980, Ser. No. 163,881

Claims priority, application Japan, Nov. 30, 1979, 54-156245

Int. Cl.³ F16B *7/00;* **E04B** *1/343, 1/58*

U.S. Cl. 403—173 **8 Claims**



1. A connector assembly for connecting vertical wooden columns with the end portions of horizontal wooden beams, said connector assembly comprising, in combination:

(A) a connector member composed of side walls and planar top and bottom end walls for closing off substantially the entire end portions of said side walls to form said connector member in a hollow block shape, said end walls each having portions defining a small, centrally located opening extending therethrough, said connector member:

having a plurality of receiving apertures integrally formed with said connector member side walls and disposed along substantially the entire height of the side walls;

(B) joiner insert means for interconnecting the ends of said connector member with the adjacent end portions of a corresponding wooden column, said joiner insert means including:

a flat liquid impervious flange section for overlying substantially an entire connector member end wall;

a first plug section extending normally from one side of said flange section to slidably engage within a corresponding connector member end wall central opening; and

a second plug section extending normally from the side of said flange section opposite said first plug section to slidably engage within a socket formed in the end portion of the column; and

(C) a bracket having:

an elongate upright wall engageable within the end portion of a wooden beam, said upright wall having a forward edge adjacent the end of the wooden beam;

a heel plate disposed transversely to, and fixedly attached to the bottom edge of said upright wall to underlie and support the bottom edge of the beam; and

latch means extending outwardly from the forward edge of said upright wall to slidably, detachably engage with said connector member receiving apertures to securely lock said bracket with said connector member.

4,398,842

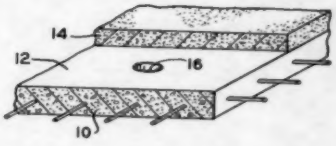
METHOD OF OVERLAY AND SANDWICH FORMATION OF PERVIOUS CONCRETE

Harry Hodson, 4730 Dunn Dr., Sarasota, Fla. 33583

Filed Dec. 29, 1980, Ser. No. 220,519

Int. Cl.³ E01C *19/00*

U.S. Cl. 404—82 **6 Claims**



1. A method of producing a self-adhering pervious concrete product for paving of the type which allows fluids to pass therethrough in combination with an existing strata, said method comprising the steps of:

(a) cleaning the surface of the existing strata;

(b) supplying a predetermined quantity of cement;

(c) supplying a predetermined quantity of water;

(d) mixing together said predetermined quantities of cement and water to form a cementitious material utilizing high energy techniques, at least until said resulting cementitious material establishes a substantially consistent viscosity;

(e) supplying a quantity of aggregate;

(f) mixing said quantity of aggregate with said cementitious material to form said pervious concrete product;

(g) coating the surface with said pervious concrete product;

(h) directly applying pervious concrete product to the required thickness, which results in a complete bonding with the existing strata.

4,398,843

SELF-ALIGNING ARRANGEMENT FOR THE ECCENTRIC MOUNTING SHAFT OF A VIBRATORY COMPACTOR

John J. Bloom, Jr., Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/1632, 371 Date Dec. 5, 1980, & 102(e) Date Dec. 5, 1980, PCT Pub. No. W082/01904

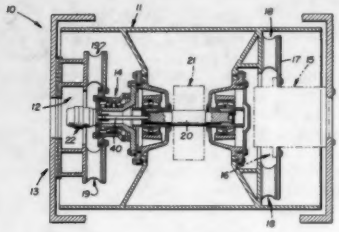
This PCT application filed Dec. 5, 1980, Ser. No. 308,748

Int. Cl.³ E01C *19/38*

U.S. Cl. 404—117 **9 Claims**

1. In a vibratory compactor (10) having a drum (11) rotatable about a longitudinal axis (A) thereof, an eccentric mounting shaft (20') rotatable about a longitudinal axis (A') thereof, and a pair of longitudinally spaced bearing assemblies (23) rotatably mounting said drum (11) on said shaft (20') and mounting said shaft (20') for rotation about the longitudinal axis (A') thereof, the improvement comprising:

self-aligning means (28') for mounting each of said bearing assemblies (23) on said shaft (20') for permitting limited relative movement transversely of said axes (A,A') between said shaft (20') and said bearing assemblies (23) to place the longitudinal axes (A,A') of said drum (11) and



said shaft (20') in co-incident relationship relative to each other, said self-aligning means (28') including a sleeve (29') mounted in each of said bearing assemblies (23) and a ball and socket connection (35') mounting said shaft (20') in said sleeve (29').

4,398,844

FLOATING BOOM STRUCTURE

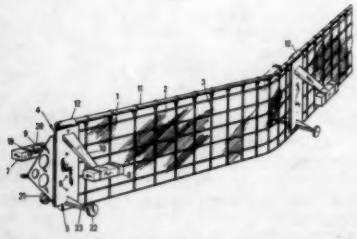
Bernard Jaffrennou, Echirolles, and Maurice Cessou, Communay, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Societe Rolba, Fontaine, both of, France

Filed Feb. 18, 1981, Ser. No. 235,474

Claims priority, application France, Feb. 14, 1980, 80 03245

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—72 **9 Claims**



1. A floating boom comprising a flexible structure making up a barrier equipped with transverse stiffeners having floats secured thereto for supporting said flexible structure in a substantially vertical position in water, each stiffener with said floats secured thereto making up a part of a buoyant unit, with successive buoyant units being interconnected by an assembly of articulated linking rods extending longitudinally along the upper part of the boom for supporting said flexible structure making up the barrier, and said linking rods being interconnected by slidable coupling means.

4,398,845

TUNNEL DRIVING APPARATUS

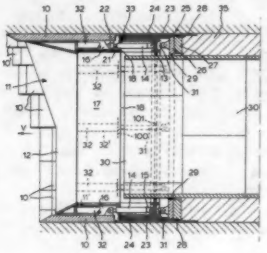
Dieter Stuckmann, Selm, and Hans Jütte, Dortmund-Holthausen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,337

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852663

Int. Cl.³ E01G *3/02*

U.S. Cl. 405—145 **17 Claims**



1. In apparatus for driving tunnels or the like; said apparatus comprising a shield with a plurality of elongate drive members (10), frame means (11) supporting the drive members for individual longitudinal displacement, and rams (14) connected between the frame means and the drive members and operable to effect advancement of the shield in a tunnel driving direction; the improvement comprising: the frame means including a cowl (11') defining a continuous, exterior, tubular, sealed enclosure with the drive members being disposed externally of the cowl, whereby compressed air may be admitted into and maintained within the shield.

4,398,846

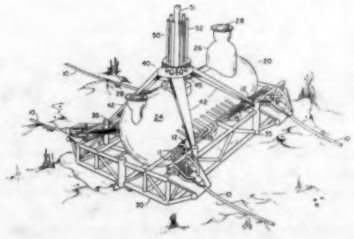
SUBSEA RISER MANIFOLD WITH STRUCTURAL SPANNING MEMBER FOR SUPPORTING PRODUCTION RISER

Fredric A. Agdern, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,526

Int. Cl.³ B63C *11/00*; E02D *21/00*; E21B *33/035, 33/038*

U.S. Cl. 405—185 **5 Claims**



1. A subsea riser manifold system for handling marine well fluids from multiple subsea wells and transmitting the well fluids to a surface facility comprising:

a riser system including a buoy located below the surface of the water, a lower rigid section extending vertically downwardly from and maintained under tension by said buoy, and an upper flexible section between said buoy and the surface facility; said lower rigid section including a plurality of lower section flowlines supported by said buoy, and a strength member; said upper flexible section

including a plurality of flexible flowlines, each connected to a respective one of said lower section flowlines;

a marine floor base template including a support structure and a plurality of pile guides connected to the template for fixing the template to the marine floor;

a sealed manifold chamber hull mounted on said support structure between said pile guides;

a structural spanning support member extending over said hull for receiving and supporting said strength member; said spanning member having an upper riser-receiving platform portion vertically spaced from said hull, and a plurality of spanning arms extending downwardly and outwardly from said platform portion, each of said spanning arms being connected to a respective one of said pile guides; and

said hull comprising manifold means therein for operatively connecting the subsea wells through said spanning member to said lower section flowlines, and means for maintaining a low pressure atmosphere;

whereby the buoyed riser load is transmitted directly to the pile guides through said spanning member.

4,398,847

CLAMPING DEVICE

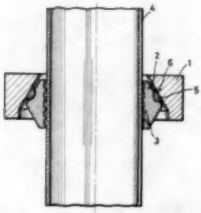
Alexandre Horowitz, Eindhoven, and Henricus P. Willemsen, Aarle Rixtel, both of Netherlands, assignors to Varitrac AG, Zug, Switzerland

Filed May 28, 1981, Ser. No. 267,997

Claims priority, application Netherlands, May 30, 1980, 8003185

Int. Cl.³ E02B *17/08*

U.S. Cl. 405—199 **15 Claims**



1. Clamping device comprising at least two clamping members which are provided with teeth on the gripping faces and each of which, via a pressure area placed at an angle with respect to the gripping face and an intermediate member abutting the former, cooperates with a pressure member capable of exerting a clamping force directed toward the gripping face, the intermediate member consisting of a slide member having a cross section in the form of a segment of a circle whose plane surface cooperates with the pressure area, and whose circular arc-shaped surface is positioned in a corresponding seating provided in the associated clamping or pressure member.

4,398,848

MARINE ENERGY CELL

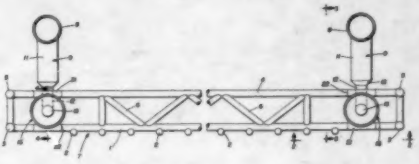
Edgar A. Guilbeau, 3106 Fairmont Ct., Sugarland, Ft. Bend County, Tex. 77478

Filed May 4, 1981, Ser. No. 259,852

Int. Cl.³ B63H *21/04*; E02B *3/22*

U.S. Cl. 405—212 **3 Claims**

1. An energy-absorbing device for mounting an extended barrier frame on column members of a marine docking facility structure for stopping ship movement at the facility, including, a pair of shock cells mounted in spaced relation on a docking facility column member; each shock cell having inner and outer cylinder members joined by an intervening rubber sleeve, with one end of the outer cylinder member mounted in fixed position on said column, and an outer end of the inner cylinder member projecting axially horizontally outward of the column; a vertically-extending tubular member mounted in fixed relation on the projecting outer ends of said shock cell inner cylinder members; a plurality of rotary energy-absorbing ring units; each ring unit having an outer cylinder ring, an inner tubular member, and an intervening rubber sleeve joining the outer ring and inner tubular member; the inner tubular



members of the rotary ring units forming integral portions at spaced intervals of the vertically-extending tubular member; a barrier frame having a plurality of spaced horizontally-extending frame members; and the horizontally-extending frame members at one end of the barrier frame being mounted in fixed positions on the outer peripheries of the cylinder rings of the rotary ring units.

4,398,849

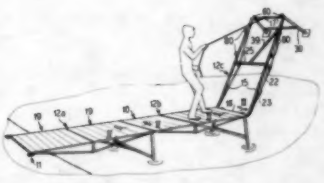
PORTABLE DOCK

James S. Moran, and Marlo W. Groezinger, both of Freeport, Ill., assignors to Highland Agro Inc., Pearl City, Ill.

Filed Dec. 24, 1981, Ser. No. 334,432

Int. Cl.³ E02B *3/20*

U.S. Cl. 405—221 **11 Claims**



1. A dock section for a portable dock composed of an anchor section and at least one dock section detachably interconnected to each other to form a pier, each dock section comprising a rectangular deck frame having a pair of side frame members, a first end frame member and a second end frame member to form a supporting surface for a removable deck assembly; a pair of leg members secured to the deck frame adjacent the second end frame member; first coupling means being provided at the first end frame member for connecting the first end frame member to another section and second coupling means on at least one of the frame members forming the pair side frame members and second end frame member to enable forming an interlocking connection with a first coupling means of another section, each of said first and second coupling means being formed by a pair of strap members, each strap member having a first portion extending from a bottom of the frame member in a plane approximately parallel to the supporting surface of the deck frame for a distance slightly greater than cross sectional dimensional of a frame member and terminating in an upwardly extending second portion forming substantially a right angle with the first portion, said pair of strap members of the first coupling means having a different spacing therebetween than the pair of strap members for the second coupling means so that one of the pairs is received between the other pairs when forming an interlocking connection with each pair engaging the frame member associated with the other pair.

4,398,850

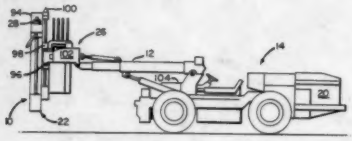
ROOF BOLTER AND PROCESS

Robert D. Talvensaari, White Pine, Mich., assignor to Copper Range Company, Lakewood, Colo.

Filed Feb. 9, 1981, Ser. No. 232,884

Int. Cl.³ E21D *20/02*; E21C *5/00, 9/00*

U.S. Cl. 405—261 **14 Claims**



1. A two-position resin type roof bolter with a single indexing between said two positions comprising:

(a) combined means for drilling and resin inserting in one position of said roof bolter without indexing between said drilling and said resin inserting;

(b) means for bolt inserting in a second position of said roof bolter after said single indexing thereof; and

(c) means for positioning said roof bolter, first into said one and then into its said second positions.

4,398,851

ARRANGEMENT FOR CONTROLLING ADVANCING TIMBERING IN UNDERGROUND MINING

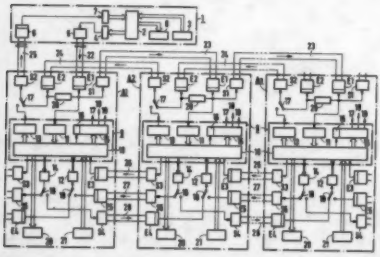
Guy Geuns, Hemhofen, and Georg Rötzer, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,545

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045452

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—302 **10 Claims**



1. In an arrangement for controlling advancing timbering in an underground mine having n timbering units, comprising: a control unit for each of the n timbering units which can be selected individually, each control unit containing an evaluation circuit; and a central control room equipped with: a system for transmitting control data delivered by a computer serially to the control units; a device indicating the state of the timbering; and an input device for selecting the computer program, the improvement comprising, in each control unit:

(a) a first receiver coupled to receive control data having its output connected to the evaluation circuit, the input to the first receiver in the first control unit coupled to the central control room,

(b) a first transmitter the first transmitters of the first n−1 control units having their outputs coupled via a control line to the inputs of the first receivers of the immediately following control units, each first transmitter having the output of the first receiver in its control unit as an input;

(c) a second transmitter having its output coupled to a further line, the further line of the second transmitter in the first control unit coupled to the central control room;

(d) a second receiver, the second receivers in the first n−1 control units having their inputs coupled to the further line which is connected to the second transmitter in the respective immediately preceding control unit; and

(e) a first switch for controllably coupling said second transmitter respectively to the evaluation circuit and to the second receiver of its control unit.

4,398,852

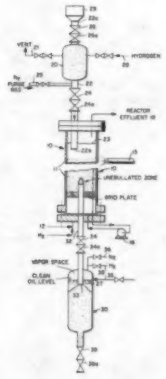
PROCESS AND APPARATUS FOR ADDING AND REMOVING PARTICLES FROM PRESSURIZED REACTORS

John D. Milligan, Little Silver, N.J., assignor to HRI, Inc., Lawrenceville, N.J.

Continuation-in-part of Ser. No. 142,523, Apr. 21, 1980, abandoned, which is a continuation of Ser. No. 920,824, Jun. 30, 1978, abandoned. This application Feb. 17, 1981, Ser. No. 235,195

Int. Cl.³ B65G *53/30*

U.S. Cl. 406—47 **7 Claims**



1. A method for withdrawing particles from a pressurized reactor, comprising:

(a) connecting a container to the bottom portion of the reactor by means of a conduit which extends to the top portion of the container by at least about 10 percent of container height;

(b) sealing the container from the reactor;

(c) filling the container with a liquid material compatible with the reactants in the reactor;

(d) pressurizing the container to substantially the reactor pressure;

(e) removing the seal between the reactor and the container to allow the particles to descend into the container, while said liquid material flows upwardly into the reactor countercurrent to the flow of particles;

(f) sealing the container from the reactor; and

(g) depressurizing the container and recovering the particles contained therein.

4,398,853

INSERT HOLDER AND METHOD OF HOLDING

Robert A. Erickson, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 205,440, Nov. 10, 1980. This application Dec. 8, 1980, Ser. No. 214,233

Int. Cl.³ B23B *29/04*

U.S. Cl. 407—104 **7 Claims**

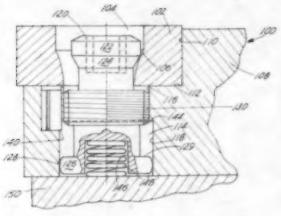
1. A toolholder for use in holding a cutting insert having a

tapered aperture wherein a wall of said aperture forms a locking face, and wherein said toolholder comprises: a toolholder body and a cooperating locking pin means;

said toolholder body comprising an insert receiving pocket having a planar bottom wall and a side wall substantially normal to said bottom wall; and a pin receiving hole formed through, and substantially normal to, said bottom wall, said pin receiving hole having a threaded section and a cylindrical smooth bore section;

said locking pin means comprising a diametrical elongate body; a clamping head having a locking shoulder; an increased diameter section having a circumferential surface which is arcuate in longitudinal cross section; and a threaded portion located between said locking shoulder and said increased diameter section;

said locking pin means rotatably mounted in said pin receiving hole with said clamping head extending into said insert receiving pocket, with said increased diameter section having a maximum diameter sized for sliding engagement with said smooth bore section of said pin receiving hole



and with the respective threaded portion and section of said locking pin means and said pin receiving hole threadedly engaged so that rotation of said locking pin means advances or retracts said locking pin means in said pin receiving hole; said locking pin means when rotated to a first position is freely tiltable so as to allow said clamping head to be inserted into said insert aperture; said locking pin means, when rotated to a second position, is held substantially laterally fixed by the sliding engagement of said increased diameter section with said smooth bore section in combination with the threaded engagement of said locking pin means threaded portion with said pin receiving hole threaded section, and wherein said locking pin means, when in said second position, loosely holds said insert captive in the toolholder pocket; and said locking pin means, when rotated from said second to a third position, causes the locking shoulder of said clamping head to abut said locking face of said insert aperture and clamp said insert against said bottom and side wall of said insert receiving pocket.

4,398,854

BORING HEAD WITH FINE ADJUSTMENT MECHANISM

Dieter Pape, Rümlang, and Hans Woerz, Oberhasli, both of Switzerland, assignors to Heinz Kaiser AG, Rümlang, Switzerland

Filed Dec. 3, 1980, Ser. No. 212,382

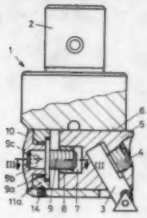
Claims priority, application Switzerland, Dec. 4, 1979, 10751/79

Int. Cl.³ B23B *51/00*

U.S. Cl. 408—185 **4 Claims**

1. In a boring head having a fine adjustment mechanism for the cutting tool, which latter is attached to a tool holder that extends displaceably in a cylindrical hole extending transversely to the longitudinal axis, the adjustment being accomplished by rotation of an adjustment screw which has a flange and is attached to the boring head in an axially undisplaceable manner and whose knob is provided with an adjustment scale, the improvement which comprises including,

an insert within the cylindrical hole, said insert having an annular portion and at least one portion extending in the axial direction of the hole, said annular portion being



positioned in a free of play manner between said knob provided with the adjustment scale and a flange of said adjustment screw, and the portion extending in the axial direction being adapted to be clamped radially against the tool holder by means of a locking screw.

4,398,855

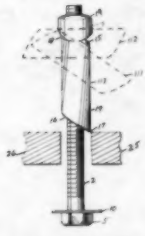
TOGGLE TYPE FASTENER

John V. Hultquist, 10500 Westminster St., Apt. #13, Garden Grove, Calif. 92643

Filed Apr. 6, 1981, Ser. No. 251,953

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—340 **10 Claims**



1. A toggle type bolt or screw fastener comrising:

(a) a shank which is at least partially threaded, wherein one end of said shank includes a saddle type end portion formed with a concave surface,

(b) a substantially cylindrically shaped member having a longitudinal bore therethrough, said member being fitted around said shank, wherein said member has a length less than that of said shank, said member having longitudinal slots extending from opposite ends on opposite sides thereof in a manner such that an opening is defined which extends traversely through said member, said opening being unthreaded and being sufficiently large to enable said member to be tilted perpendicular to said shank after said member and said saddle end portion are inserted through a hole in a desired material, wherein the surfaces defined on said member by said longitudinal slots are planar.

wherein said concave surface of said saddle end portion of said shank is adapted to engage and bear against the top and side surface of said member when said member is tilted perpendicularly to said shank to prevent the shank from rotating with respect to said member.

4,398,856

HEAVY DUTY CLOSING MACHINE WITH CALENDAR HANGER FEED UNIT

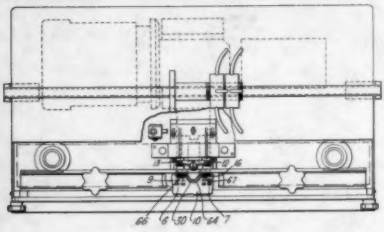
Derek J. Archer, Weybridge, and Leonard W. N. Jones, Camberley, both of England, assignors to James Burn Bindings Limited, Surrey, England

Filed Sep. 9, 1981, Ser. No. 300,497

Claims priority, application United Kingdom, Sep. 11, 1980, 8029337

Int. Cl.³ B42B 5/10; B21F 35/02

U.S. Cl. 412—39 5 Claims



1. A closing machine for closing wire binding elements comprising a press means and anvil for closing wire binding elements around a bundle of sheets, a magazine for storing hanger elements, and translating means for translating the hanger elements singly from the magazine to a press position between the press means and anvil.

4,398,857

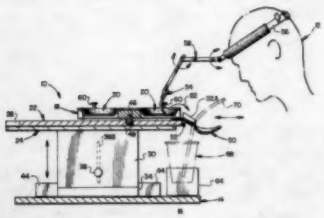
SELF-FEEDING APPLIANCE

Frank D. Layman, Sr., 720 N. McKown, Sherman, Tex. 75090

Filed Nov. 23, 1981, Ser. No. 323,741

Int. Cl.³ A47G 21/00, 19/30, 23/08

U.S. Cl. 414—9 1 Claim



1. A self-feeding appliance for use by persons who have lost the use of both arms comprising, in combination:

a support platform having a service deck;

a service platform movably mounted for vertical displacement in elevation above said support platform;

a carriage panel mounted on said service platform for movement from a retracted position overlying said service deck to an extended position forward the service deck;

a spoon mounted on said carriage panel and projecting laterally over said service deck;

a turntable mounted for rotation on said carriage panel;

a food dish carried by said turntable; and,

an open channel member mounted on said carriage panel having an elevated open end adjacent said turntable and a lower open end overlying said spoon for guiding food scraped from said dish into said spoon.

4,398,858

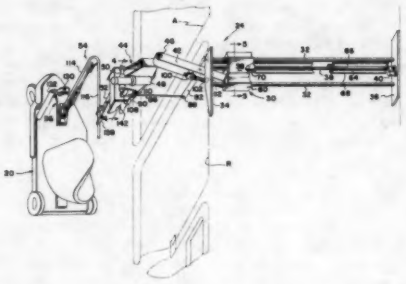
APPARATUS FOR LOADING AND UNLOADING A SECONDARY VEHICLE INTO AND FROM AN AUTOMOBILE

Edgar C. Paffrath, Birch Run, Mich., assignor to Amigo Sales, Inc., Bridgeport, Mich.

Filed Oct. 31, 1980, Ser. No. 202,642

Int. Cl.³ B60P 1/54

U.S. Cl. 414—462 26 Claims



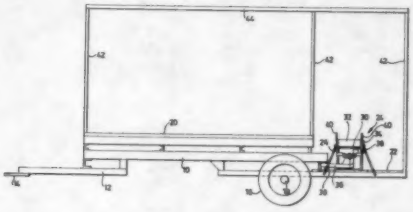
1. For use in combination with an automotive vehicle having a frame, a driver's seat, and a rear door opening rearwardly of and adjacent to said driver's seat affording access to a compartment in the interior of the vehicle rearwardly of the driver's seat; a loading apparatus for loading and unloading a secondary vehicle usable by a handicapped person into or out of said compartment said secondary vehicle having a length greater than the width of said rear door opening and a width less than that of said rear door opening, said apparatus comprising a traversing head mounted within said automotive vehicle for movement transversely within said vehicle from an operating position adjacent said rear door opening and a retracted position spaced substantially inwardly to said vehicle from said rear door opening, a lifting head carried by said traversing head to be located within the interior of said vehicle when said traversing head is in said retracted position and to be located outside of said rear door opening when said traversing head is in said operating position, lift means on said lifting head detachably engageable with said secondary vehicle for raising and lowering said secondary vehicle between the ground and an elevated position above the lower edge of said rear door opening with said secondary vehicle disposed in a position parallel to said automotive vehicle, alignment means engageable between said lifting head and said lift means when said secondary vehicle is positioned in said elevated position by said lifting means to locate the secondary vehicle in a predetermined alignment with said lifting head, pivot means mounting said lifting head on said traversing head for pivotal movement about a substantially vertical axis, and latch means maintaining said lifting head in a stored pivotal position with respect to said traversing head automatically releasable upon the approach of said traversing head to said operating position to permit pivoting of said lifting head about said axis to a lift/lower position wherein the secondary vehicle is disposed in parallel relationship to said automotive vehicle and pivoting of said lifting head in the opposite direction about said axis to a relatched storage position wherein the secondary vehicle supported from said lifting head is located in an endwise position relative to said automotive vehicle for passage through said door opening upon traversing movement of said traversing head.

4,398,859

TRAILERS

Robert Ball, Hundred End Farm, Shore Rd., Hesketh Bank, Lancashire, England

Filed Mar. 6, 1980, Ser. No. 127,570
Int. Cl.³ B60P 1/00
U.S. Cl. 414—523 11 Claims



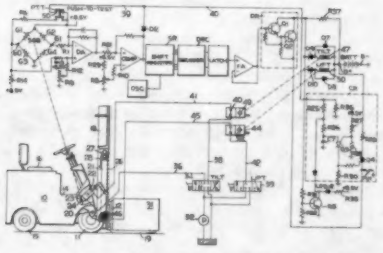
1. A vehicle or trailer which is adapted to be connected to a towing vehicle comprising a chassis having at least one pair of wheels rotatably mounted thereon; a main load-carrying platform mounted on the chassis; a secondary platform disposed at a lower level than the main load-carrying platform and a pivotally mounted elevator, the elevator being pivotally movable from an operative position in which the elevator extends transversely of the longitudinal axis of the vehicle or trailer from one side thereof to an out of use position in which the elevator extends substantially parallel to the longitudinal axis of the vehicle or trailer and said elevator further being disposed below the main load-carrying platform in the out of use position.

4,398,860

FORK LIFT TRUCK HAVING MEANS TO TEST OVERLOAD PROTECTIVE SYSTEM

Terry R. Downing, Hazel Crest, Ill., and Allois F. Geiersbach, Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 666,044, Mar. 11, 1976, abandoned.
This application Jan. 10, 1978, Ser. No. 868,345
Int. Cl.³ B65G 19/00
U.S. Cl. 414—634 14 Claims



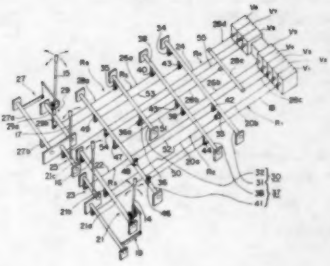
1. In a fork lift truck having a tilting mast, a load supporting carriage, a mast tilting motor, a carriage elevating motor for raising and lowering said carriage on said mast, overload protective means including sensor means for generating an electrical tilting-moment signal which is a function of the tilting moment acting on said truck and which tilting moment is dependent upon the elevation of said carriage, the weight of the load on the carriage and the angle of inclination of the mast, means receiving said tilting-moment signal as an input for disabling said carriage elevating motor and said mast tilting motor in response to a predetermined value thereof indicative of an overload on said truck, means for providing an indication that said disabling means has operated to disable said carriage elevating and mast tilting motors, and overload simulating means for selectively causing said sensor means to generate a tilting-moment signal having a value equal at least to said predetermined value, thereby permitting the truck operator to simulate an overload on said truck and ascertain from said indication whether or not said truck is protected from picking up on overload.

4,398,861

MANEUVERING PORTION STRUCTURE OF AN EXCAVATION WORK VEHICLE

Shizuo Shimoie, Sakai, Japan, assignor to Kubota Ltd., Japan

PCT No. PCT/JP80/00192, § 371 Date Dec. 2, 1980, § 102(e) Date Dec. 2, 1980, PCT Pub. No. WO82/00676, PCT Pub. Date Mar. 4, 1982
PCT Filed Aug. 22, 1980, Ser. No. 220,030
Int. Cl.³ E02F 9/20
U.S. Cl. 414—694 8 Claims



1. A control handle structure of an excavation work vehicle, characterized in that a maneuvering valve (V_1) for boom swiveling, a maneuvering valve (V_8) for boom up-and-down rocking, a maneuvering valve (V_2) for arm rocking and a maneuvering valve (V_5) for bucket pivoting are disposed substantially in parallel; that the four maneuvering valves (V_1),(V_8),(V_2),(V_5) are interlockingly connected, in a manner capable of separate individual maneuvering and capable of simultaneous maneuvering in respective pairs, via first, second, third and fourth interlocking systems (R_1), (R_6), (R_2), (R_5) parallel with one another using respective push-pull rods, to two maneuvering levers (14), (15) adapted for free rocking, bi-directional maneuvering in back-and-forth and right-and-left directions of the vehicle; that there is provided, intermediary of the interlocking systems (R_1), (R_6), (R_2), (R_5), an interlocking mode change-over mechanism (30) for changing the mode of the interlocking between said two maneuvering levers (14), (15) and said four maneuvering valves (V_1), (V_8), (V_2), (V_5);

that the interlocking mode change-over mechanism connects the maneuvering valve (V_1) for boom swiveling and maneuvering valve (V_2) for arm rocking interlockingly with said one maneuvering lever (14) and connects the maneuvering valve (V_8) for boom up-and-down rocking and said maneuvering valve (V_5) for bucket pivoting interlockingly with the said other maneuvering lever (15);

that the interlocking mode change-over mechanism (30) connects the maneuvering valve (V_1) for boom swiveling and maneuvering valve (V_8) for boom up-and-down rocking interlockingly with said one maneuvering lever (14) and connects the maneuvering valve (V_2) for arm rocking and said maneuvering valve (V_5) for bucket pivoting interlockingly with said other maneuvering lever (15);

that in the interlocking mode change-over mechanism (30) there is rotatably provided an arm-maneuvering intermediary pipe shaft (31) and a boom-maneuvering intermediary pipe shaft (32), these intermediary pipe shafts (31),

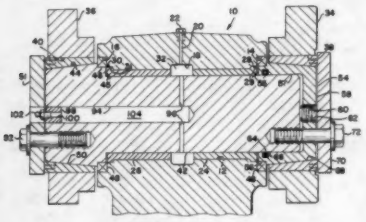
(32), being disposed with their rotation axes extending in the direction normal to the maneuvering direction of respective juxtaposed push-pull rods (20*a*), (20*b*), (28*a–d*) of the third interlocking system (R_2), and the second interlocking system (R_6); that on the arm-maneuvering intermediary pipe-shaft (31) there are protrudingly provided in the same direction a first connection arm (33), for connecting a partial member (20*a*), made releasable and remountable, out of push-pull rods (20*a*), (20*b*), of the third interlocking system (R_2) interlockingly with the one maneuvering lever (14), and a second connection arm (34), for connecting the releasable and remountable push-pull rod (20*a*) interlockingly with the said other maneuvering lever (15); and that on the said boom-maneuvering intermediary pipe shaft (32) there are protrudingly provided in the same direction a first connection arm (36), for connecting a releasable and remountable push-pull rod (28*a*) of the second interlocking system (R_6)., interlockingly with the one maneuvering lever (14), and a second connection arm (35), for connecting interlockingly with the other maneuvering lever (15).

4,398,862

PIVOT PIN ASSEMBLY

William L. Schroeder, Buffalo Grove, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 351,046
Int. Cl.³ F16C *11/02*
U.S. Cl. 414—723 **7 Claims**



6. A pivot pin assembly for pivotal mounting of a bucket on a boom arm, said bucket having a pair of apertured brackets secured thereto and said boom arm having a transverse bore, said pivot pin assembly comprising:

bearings retained in said transverse bore;

a pivot pin having one end fixed within the aperture of one of said brackets, a body rotatably mounted in said bearing, and a distal end associated with the aperture of the other of said brackets;

a cup-like thrust collar disposed on said distal end of said pin, said thrust collar having an externally tapered cylindrical wall and a radial wall spanning one end of the thrust collar;

an internally tapered split wedge collar disposed in the aperture of the other of said brackets and engaging said thrust collar;

an end plate disposed outwardly adjacent said tapered split wedge collar;

means interconnecting the pin and said end plate to draw said split wedge collar into locked engagement with said thrust collar within said other aperture; and

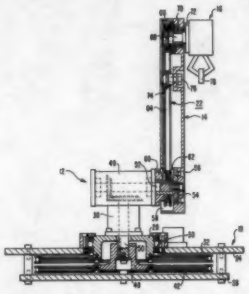
clearance fixing means interacting between said thrust collar and said pin for selectively fixing the clearance between said radial wall of said thrust collar and said distal end of said pin.

4,398,863

PICK AND PLACE ROBOT

Lanson Y. Shum, Salem Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1981, Ser. No. 264,152
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—733 **1 Claim**



1. A pick and place robot structure comprising:

a fixed support structure;

a rotatable turret carried by said support structure for rotation about one axis;

an arm having one end portion pivotally carried by said turret for swinging movement of the arm about a second axis normal to said one axis to carry the other end portion of the arm through an arc of up to about a half circle;

a working tool, such as a gripper, carried at said other end portion of said arm;

first drive means to swing said arm;

second drive means carried by said support structure, and operable independently of said first drive means to rotate said turret;

constant orientation means associated with said turret structure at said one end portion of said arm and connected to said working tool at said other end portion of said arm to maintain the orientation of the axis of the working tool in one given orientation irrespective of movement of said arm and said turret, so that the disposition of the object being carried from a pick location to a place location by the working tool of the robot remains the same between the two locations;

said first drive means is supported by said support structure and connected through said turret to effect swinging of said arm;

said constant orientation means includes a linking mechanism including a first sprocket fixed against rotation to said turret in a location concentric to said second axis, a second sprocket rotatably connected to said arm at said other end portion of said arm, said second sprocket being fixedly connected to said working tool to effect rotation of said tool in accordance with rotation of said second sprocket, and toothed linking means connecting said sprockets so that as said arm is swung, said linking means walks around said first sprocket and effects rotation of said second sprocket in accordance with the degree of swing of said arm;

said first and second drive means include a lower driven sprocket and an upper, parallel, co-axial, driven sprocket, respectively;

said upper driven sprocket having fixed thereto an inverted cup-shaped element rotatably carried by said support structure and serving as the base of said turret and fixedly attached thereto;

said lower driven sprocket being connected to shaft means extending co-axially and rotatably through said cup-shaped element into said turret, right angle drive means in

said turret for transmitting motion of said shaft means to right angle shaft means fixed to said arm to effect swinging of said arm in accordance with rotation of said right angle shaft means.

4,398,864

SEALING DEVICE BETWEEN TWO ELEMENTS OF A TURBOMACHINE

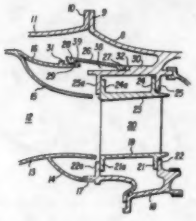
Andre A. M. L. Camboulives, Savigny sur Orge; Claude C. Hallinger, Le Mee sur Seine, and Roger A. J. Vandenbroucke, Antony, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Apr. 30, 1980, Ser. No. 145,022

Claims priority, application France, May 2, 1979, 79 11527

Int. Cl.³ F01D *25/26, 9/00*

U.S. Cl. 415—134 **9 Claims**



1. A sealing device for sealing gases within a turbomachine comprising:

an axially extending collar disposed within said turbomachine;

first and second bearing surfaces integral with and protruding from said axially extending collar;

a combustion chamber wall having a collar member with an exterior surface portion in contact with said first bearing surface;

a turbine nozzle housing having an exterior surface portion in contact with said second bearing surface wherein said axially extending collar further comprises a material having a lower coefficient of thermal expansion than said exterior surface portion of said collar member of said combustion chamber and said exterior portion of said turbine nozzle support housing such that said gases are sealed within said turbomachine between said combustion chamber wall and said support housing by said axially extending collar.

4,398,865

EXHAUST PIPE OF TURBINE

Anatoly V. Garkusha, ulitsa 23 Avgusta 63, kv. 82, and Vladimir E. Dobrynin, pereulok Zernovoi, 6/4, kv. 49, both of Kharkov, U.S.S.R.

PCT No. PCT/SU79/00110, § 371 Date Jul. 10, 1980, § 102(e) Date Jun. 30, 1980, PCT Pub. No. WO80/00989, PCT Pub. Date May 15, 1980

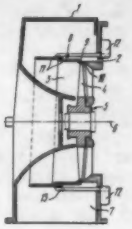
PCT Filed Nov. 6, 1979, Ser. No. 197,771

Claims priority, application U.S.S.R., Nov. 10, 1978, 2684832

Int. Cl.³ F01D *17/14*

U.S. Cl. 415—148 **20 Claims**

1. An exhaust pipe of a turbine having in the inlet portion thereof a guide defining the inner side surface of said pipe and which is essentially the surface of a body of revolution about a longitudinal axis coincident with the axis of said turbine, and so disposed that one its end adjoins the outer ends of the blades of the runner of the turbine, said guide being movable to vary the



area of the flow cross-section of the inlet portion of said exhaust pipe.

4,398,866

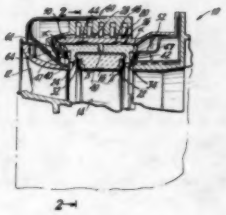
COMPOSITE CERAMIC/METAL CYLINDER FOR GAS TURBINE ENGINE

Edward O. Hartel, Orange; Zoltan L. Libertini, Stamford; Joseph C. Manente, Jr., Monroe, and Donald E. Wilson, Derby, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jun. 24, 1981, Ser. No. 276,843

Int. Cl.³ F01D *5/08*

U.S. Cl. 415—180 **4 Claims**



1. A gas turbine engine cylinder forming a portion of the turbine assembly surrounding the tips of a plurality of blades of a rotor, said cylinder comprising:

an inner ceramic ring having a radially inner surface which is spaced from the tips of said rotor blades forward and trailing surfaces extending radially outward from said inner surface, and an outer surface extending axially between said forward and trailing surfaces, the cross-section of said inner ceramic ring being trapezoidal in shape with the sides thereof, formed by the forward and trailing surfaces, tapering inward as said surfaces approach the radially inner surface of said inner ceramic ring;

a pair of intermediate, ceramic rings, each of said rings having a substantially L-shaped cross-section including an axially extending cylindrical base portion which is disposed parallel to the longitudinal axis of the turbine engine, and radially inward extending leg portions, each of said leg portions having axially spaced inner and outer surfaces, said rings being assembled in axially spaced, opposing relation to form an annular receptacle to receive and entrap the inner ceramic ring, said axial spacing forming a gap between said rings to assure a continuous contact with the inner ring, said inner surfaces of said leg portions engaging the forward and trailing surfaces of the inner ceramic ring and said outer surfaces of said leg portions being tapered inward as said surfaces approach the inner ceramic ring; and

an outer support means disposed about and supporting said intermediate annular ceramic rings relative to said inner

ceramic ring, said outer support means comprising an annular, metallic support clamp having radially inward extending flanges to engage and secure the intermediate ceramic rings in assembled position, at least one of the clamp flanges being constructed of spring metal and engaging the intermediate ceramic rings to bias said rings inward to maintain entrapping engagement between the intermediate ceramic rings and the inner ceramic ring.

4,398,867

CENTRIFUGAL PUMP CASING

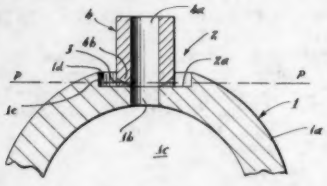
Robert Dernedde, Frankenthal; Hans-Joachim Franke, Grünstadt, and Peter Havekost, Bobenheim, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker AG, Frankenthal, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,441

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940029

Int. Cl.³ F01D *1/00, 25/24;* **F04D** *29/40*

U.S. Cl. 415—219 C **18 Claims**



1. A pump casing, particularly a centrifugal pump casing, comprising:

(a) a shell having an arcuate periphery and a first longitudinal axis, said periphery being provided with a facet;

(b) a tubular element having an end face and a second longitudinal axis, said tubular element being arranged so that said end face confronts said facet and said second axis extends transversely of said first axis; and

(c) a weld seam contacting said facet and connecting said tubular element to said shell, said seam extending in circumferential direction of said end face and being substantially complete in said direction, and said seam following a substantially planar path along said direction.

4,398,868

CONTROL APPARATUS FOR A GAS DYNAMIC PRESSURE-WAVE MACHINE FOR CHARGING COMBUSTION ENGINES

Christian Komauer, Nussbaumen, and Andreas Mayer, Niederrohrdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 16, 1981, Ser. No. 254,873

Claims priority, application European Pat. Off., May 2, 1980, 80200410

Int. Cl.³ F04F *5/32, 11/02*

U.S. Cl. 417—64 **7 Claims**

1. A control apparatus for use in a gas dynamic pressure-wave machine for charging combusion engines, comprising:

a pressure-wave machine provided with a high-pressure exhast gas channel;

said pressure-wave machine including a housing containing a cell rotor;

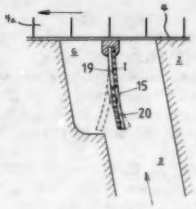
said high-pressure exhaust gas channel being provided with a gas pocket at a location before opening into the cell rotor in order to branch-off high-pressure exhaust gases into an auxiliary flow at predetermined operating conditions of the engine;

a flap member arranged in the high-pressure exhaust gas channel;

said flap member being fixedly clamped in the housing of the pressure-wave machine along one of its edges;

said flap member experiencing a bending deformation when exposed to temperature changes;

said flap member forming a partition wall between the high-pressure exhaust gas channel and the gas pocket; and



the flap member being structured to possess a temperature-dependent bending deformation whose magnitude and course corresponds to a temperature-dependent opening characteristic of an inflow cross-section of the gas pocket and which is desired for the pressure-wave machine.

4,398,869

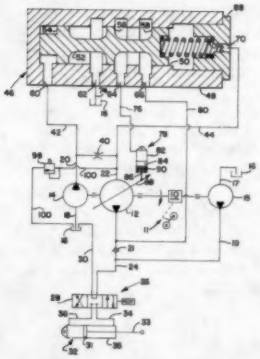
CONTROL MEANS FOR VARIABLE DISPLACEMENT PUMP

Steven C. Kirkham, McHenry, and Ronald K. Schantz, Libertyville, both of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 153,120, May 27, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 439,703

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—216 **2 Claims**



1. Control means for a variable displacement pump driven by an engine, said control means comprising:

a movable control ram operably connected to said pump for regulating the output flow from said variable displacement pump between a maximum and a minimum;

biasing means urging said ram in a direction to provide maximum flow from said variable displacement pump;

a charge pump driven by the engine for supplying fluid under pressure to said variable displacement pump;

a first conduit extending from said charge pump to said variable displacement pump for carrying said fluid;

an orifice in said first conduit whereby said fluid flowing therethrough causes a pressure difference thereacross;

a second conduit extending between said variable displacement pump and said control ram;

a speed valve located in said second conduit and including a

spring-biased spool movable therein in response to said pressure difference across said orifice, and independently of the output pressure of said variable pump between a first position permitting fluid flow to said control ram from said variable displacement pump and a second position preventing such flow;

a first pilot conduit connected between said first conduit on the downstream side of said orifice and one end of said speed valve and a second pilot conduit connected between said first conduit on the upstream side of said orifice and the other end of said speed valve, whereby, when said pressure difference is low, said spring-bias moves said spool to a position wherein said control ram is positioned to provide for maximum fluid flow from said variable speed pump, and, when said pressure difference is high, said spool is moved by higher pressure in said second pilot conduit to a position wherein said control ram provides for minimum fluid flow from said variable displacement pump.

4,398,870

VARIABLE VOLUME SONIC PRESSURE WAVE SURFACE OPERATED PUMP

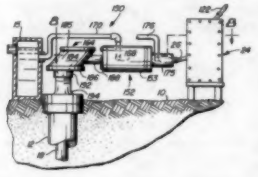
Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201

Continuation-in-part of Ser. No. 253,317, Apr. 13, 1981, which is a continuation-in-part of Ser. No. 160,934, Jun. 19, 1980, Pat. No. 4,341,505, which is a continuation-in-part of Ser. No. 958,552, Nov. 8, 1978, Pat. No. 4,259,799. This application Apr. 15, 1981, Ser. No. 254,451

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.³ F04B *47/12*

U.S. Cl. 417—240 **24 Claims**



1. A variable volume sonic pressure wave surface operated single tube pump for pumping liquid from an underground level to a ground surface comprising:

(a) a sonic pressure wave generator including,

I. a cylinder housing having a bore for containing liquid in one end portion thereof and having a liquid delivery port means extending laterally from that bore,

II. a liquid impacting piston reciprocal in the bore of said cylinder housing for opening and closing the liquid delivery port means thereof and for reciprocally impacting the liquid containable therein,

III. said liquid impacting piston having a liquid impacting end face with a central recess formed therein which generates a sonic pressure wave upon impacting the liquid containable in the bore of said cylinder housing,

IV. a sonic inductor in the form of a sonic nozzle having a bore for containing liquid located in the one end portion of the bore of said cylinder housing so that the bore of said sonic nozzle is coaxial with the bore of said cylinder housing;

(b) a metallic tube having a bore for containing liquid and having one end which is in communication with the bore of said nozzle so that the sonic pressure waves generatable in said cylinder housing will pass through said sonic nozzle and be received and transmitted in the bore of said metallic tube;

(c) pumping mechanism means connected to the other end of said metallic tube and in communication with the liquid to be pumped, said pumping mechanism means including a reciprocally operable plunger for impingingly receiving the sonic pressure waves when transmitted by said metallic tube and reflecting those waves into a centrally and upwardly moving column which carries the liquid being pumped in the same direction;

(d) power input means; and

(e) drive/output volume adjustment means connected to receive power from said power input means and coupled to said liquid impacting piston for reciprocal driving thereof, said drive/output volume adjustment means including means for adjustably varying the stroke of said liquid impacting piston for adjusting the output volume of the liquid being pumped.

4,398,871

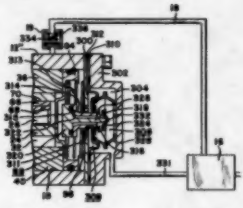
MOVABLE END PLATE FOR A VACUUM PUMP

Frederick G. Grabb, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 107,125, Dec. 26, 1979, Pat. No. 4,336,004. This application Sep. 23, 1981, Ser. No. 304,763

Int. Cl.³ F04B *49/02, 49/08*

U.S. Cl. 417—283 **2 Claims**



1. In a pump having a housing with an operational cavity therein, a rotor having vanes located in the operational cavity and an input member for moving the rotor in said cavity to move a fluid from an inlet port to an outlet port through the cavity and thereby to create a fluid pressure differential between the inlet port and the outlet port, the improvement comprising:

by-pass means for connecting the outlet port to the inlet port when the fluid pressure differential reaches a predetermined level to substantially reduce the resistance to movement of the rotor in the operational cavity;

a control cavity located in the housing;

an end plate located in said housing to separate the control cavity into a by-pass chamber and a control chamber, said by-pass chamber being connected to a series of chambers between the vanes, and said control chamber being connected to said inlet port; and

first resilient means located in said control cavity for urging said end plate toward the vanes to attenuate fluid communication through said by-pass chamber, said fluid pressure differential acting across said end plate and overcoming said first resilient means when the predetermined level is reached to move the end plate and allow communication from the inlet port to the outlet port through the by-pass chamber;

a diaphragm for separating the control chamber from a sensing chamber, said sensing chamber being connected to said inlet port and said control chamber, said control chamber being connected to said surrounding environment;

a valve carried by said diaphragm having a poppet assembly therein for controlling communication between said control chamber and said sensing chamber; and

second resilient means located in said sensing chamber urging said diaphragm toward the control chamber, said diaphragm responding to a sensed pressure differential

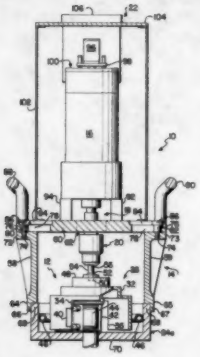
created by air from the environment on one side of the diaphragm and the fluid pressure at the inlet port in the sensing chamber by overcoming said second resilient means to move said valve to interrupt fluid communication between the control chamber and the surrounding environment while initiating fluid communication between said sensing chamber and the control chamber to develop said fluid pressure differential across said end plate.

4,398,872

AUXILIARY POWERED DRIVE FOR ROLLER PUMP USED IN CARDIOPULMONARY BYPASS OPERATIONS

Jonathan T. Fleenor; George W. Long, Jr., and John M. Dawson, all of Kansas City, Mo., assignors to Trinity Lutheran Hospital, Kansas City, Mo.

Filed Jun. 19, 1980, Ser. No. 160,965
Int. Cl.³ F04B *39/14, 43/12*
U.S. Cl. 417—360 3 Claims



1. For use with a cardiopulmonary perfusion console having an upwardly facing roller pump provided with a central, exposed rotor, an auxiliary power drive system for rotating the rotor of the roller pump during cardiopulmonary bypass operations to assure continued, powered, non-manual operation of the pump for extended periods of time beyond the practical endurance of hand rotation thereof at preselected, critical rates, in the event of failure of the normal pump drive, said auxiliary power drive system comprising:

a base unit;

a reversible electric motor carried by the base unit and provided with a drive shaft extending toward the base unit,

said base unit including means engageable with the perfusion console pump and operable to stably support the base unit and the motor thereon in disposition with the motor shaft directly aligned with the rotor,

said base unit further including support members having means for complementally engaging failed roller pump and a platform apertured for passage therethrough of said motor drive shaft, said support members being attached to said platform by shiftable means allowing limited transverse movement of said support members with respect to accommodate different sized pumps;

the construction and arrangement of the base unit and motor being such that in the event of a pump failure the base unit and motor may simply be lifted from an adjacent storage position and placed directly on the pump;

an adapter including means for operatively and drivingly engaging said pump rotor when said base unit is operatively placed on the failed pump;

means for operably joining said drive shaft and said adapter and of a length such that the adapter is in proper disposition to drive the pump rotor by mere placement of the base unit and said motor on the failed pump; and

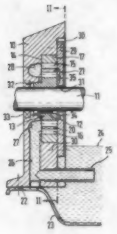
means coupled with the motor for permitting selective control of the motor and to effect substantially instantaneous reversal of the direction of rotation thereof.

4,398,873

DEVICE FOR SEALING THE PENETRATION OF DRIVE SHAFT/HOUSING IN ROTARY PUMPS FOR LIQUIDS, ESPECIALLY OIL PUMPS FOR MOTOR VEHICLES

Ekkehard Siegel, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 83,102, Oct. 9, 1979, abandoned. This application Aug. 18, 1981, Ser. No. 293,967
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846823
Int. Cl.³ F04C *2/10, 15/00;* F16J *15/40*
U.S. Cl. 418—81 1 Claim



1. Device for sealing the penetration of drive shaft/housing to prevent aspiration of ambient air in rotary pumps for liquids, especially oil pumps with an inside gear with external teeth which is driven by a drive shaft and interacts with an internal gear ring surrounding it eccentrically, the gear and gear ring being located in a cylindrical recess of the pump housing, and wherein the axial mobility of the pump gears is bounded at least on one side by a housing cover having an opening for the penetration of the drive shaft characterized by the fact that an annular groove and a connecting channel are machined into the front face of the housing cover facing the inside gear and wherein said annular groove is surrounding the penetration for the drive shaft and serving as a sole hydraulic and only seal for the drive shaft penetration, and is connected with the pressure section of the pump by means of the channel.

4,398,874

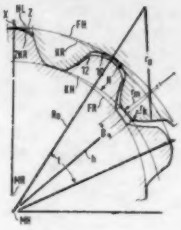
GEAR RING PUMP

Siegfried Eisenmann, Conchesstrasse 25, 7960 Aulendorf, Fed. Rep. of Germany

Filed Jun. 30, 1981, Ser. No. 279,042
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026222
Int. Cl.³ F04C *2/10*
U.S. Cl. 418—171 15 Claims

1. A gear ring pump, comprising a housing having an inner hollow and defining a suction side and a pressure side; a hollow gear arranged in said housing and provided with between eight and sixteen teeth; a driven pinion provided with further teeth having by one tooth less than said hollow gear and engaging with said hollow gear so as to form a region of deepest engagement and a region which is opposite to the latter, the teeth heads of said pinion sliding over the teeth of said hollow gear in the opposite region whereas the driving teeth flanks of said pinion abut against the teeth of said hollow gear in said region of deepest engagement so as to provide sealing between said suction side and pressure side, said teeth being formed so that the teeth heads of said pinion are freely received into the teeth

gaps of said hollow gear and the teeth of said pinion has a shape determined by rolling of said pinion over said hollow gear, the



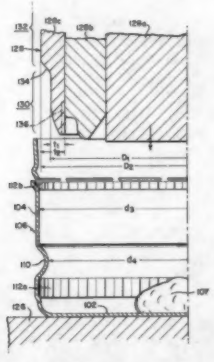
teeth of said hollow gear having an approximately trapezoidal shape with convexly curved flanks and heads.

4,398,875

MOLDING TOOL FOR FORMING A CLOSURE SHELL LINER

Masayoshi Kawashima, Ibaragi, and Akio Yuasa, Toyonaka, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,156
Claims priority, application Japan, Apr. 28, 1980, 55-55387
Int. Cl.³ B29C *3/00*
U.S. Cl. 425—127 **2 Claims**



1. A molding tool for forming a closure shell liner on the inside surface of a circular top panel of a closure shell where the shell has a cylindrical skirt extending downwardly from the peripheral edge of the top panel and a circumferentially extending annular groove formed on the upper portion of the skirt, and where the tool comprises a central molding member and a shell positioning external sleeve disposed externally of the central molding member; characterized in that said sleeve has an upper portion extending axially downwardly substantially to a point opposite said groove when said tool is inserted into said shell and a lower portion extending axially downwardly from said point to the lower end of said sleeve and wherein the outer diameter of the upper portion of the sleeve exceeds the outer diameter of the lower portion of the sleeve by an amount equal to twice the radial depth of the groove in the skirt.

4,398,876

HOT-BRIQUETTING APPARATUS FOR REDUCED IRON

Kimiaki Ohtawa; Hiroyoshi Takahashi, and Yasuo Fukada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 253,142
Claims priority, application Japan, Apr. 24, 1980, 55-53594
Int. Cl.³ B28B *17/00*
U.S. Cl. 425—143 **3 Claims**

1. In a hot-briquetting apparatus for producing reduced iron briquettes which comprises a container for receiving high temperature reduced iron; a storage tank connected to said container with an opening at the upper end to receive said reduced iron from said container and which storage tank has an opening at the lower end thereof; a briquetting machine located at the bottom opening of said storage tank and means located at a lower portion of said storage tank for forcibly feeding the reduced iron into the briquetting machine; the improvement which comprises charging means connected to the storage tank below said upper opening for introducing (1) residual high temperature reduced iron produced from the briquetting of the reduced iron with the briquetting machine; (2) carbon or (3) mixtures of said residual reduced iron produced from the briquetting machine and carbon; and which charging means includes means for introducing an inert gas into said charging means, and a hopper, connected to said charging means, for receiving the iron produced from the briquetting machine; carbon or mixtures of said reduced iron or carbon as set forth in (1), (2) or (3) above; said charging means being driven by a drive motor whose rotation is controlled by a control means, said control means being activated by means for detecting the temperature of the reduced iron, said temperature detecting means being located in said storage tank, wherein said charging means connected to said storage tank penetrates through a wall of the storage tank so that the connection between the charging means and the storage tank is fluid tight.

4,398,877

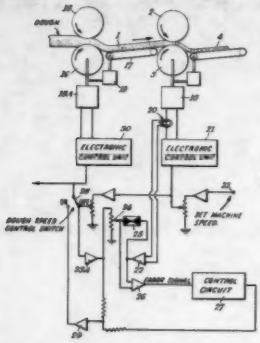
SHEETING OF BISCUIT DOUGH

Peter A. Taylor, Deeping St. James, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed May 29, 1981, Ser. No. 268,475
Claims priority, application United Kingdom, Jun. 18, 1980, 8019865
Int. Cl.³ A21C *3/02*; B29C *15/00*
U.S. Cl. 425—145 **4 Claims**

1. An apparatus for supplying a sheet of biscuit dough having a predetermined and uniform thickness to a cutting apparatus, the apparatus including a pair of gauge rollers which are spaced apart a predetermined amount and form a nip therebe-

tween through which the sheet of biscuit dough passes; a pair of feed rollers between which the sheet of biscuit dough passes before entering the nip between the gauge rollers; a first electrical drive unit connected to the gauge rollers to cause them to rotate; a second electrical drive unit connected to the feed rollers to cause them to rotate; a transducer connected to the



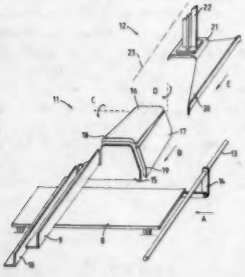
first drive unit for measuring the power consumed thereby and for providing an electrical signal representative thereof; and electrical control means connected between the transducer and the second electrical drive unit to cause the second electrical drive unit to rotate the feed rollers at a suitable speed based on the deviation of the electrical signal from the transducer from a desired value.

4,398,878

APPARATUS FOR MAKING SHAPED CONCRETE ARTICLES

Bengt Persson, Götene, Sweden, assignor to Br Perssons Cementvarufabrik AB, Sweden

Continuation-in-part of Ser. No. 124,672, Feb. 26, 1980, abandoned. This application Apr. 17, 1981, Ser. No. 255,124
Claims priority, application Sweden, Mar. 1, 1979, 7901846
Int. Cl.³ B28B *13/00*
U.S. Cl. 425—385 **8 Claims**



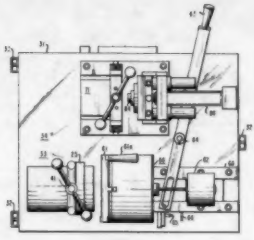
1. An apparatus for adjusting the dimensions and shape of an elongated article molded from concrete in a mold, comprising a support surface for the article, a straight-edge rule, means for moving said support surface towards and from said straight-edge rule, a first and a second pressing plate adjacent respectively a first and a second end of said straight-edge rule and movable in the longitudinal direction of the rule, and a member profiled to the shape desired of the finished concrete article, movable in a direction parallel to the longitudinal direction of the rule, and arranged to contact at least a side surface of the article remote from the rule.

4,398,879

ON-SITE FABRICATING OF PLASTIC PIPE FITTINGS

Paul R. DuPont, 104 Mountain Ave., Gillette, N.J. 07933, and Craig R. Nelson, 120 Floral Ave., Murray Hill, N.J. 07074

Filed Jun. 19, 1981, Ser. No. 275,412
Int. Cl.³ B29C *17/00*
U.S. Cl. 425—392 **7 Claims**



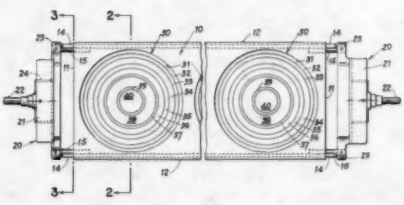
1. A portable plastic pipe-end reforming apparatus comprising a planar table having mounted thereon an oven having a uniformly heated internal cavity for accommodating therein a range of different pipe diameters, segmented heat-sinking clamp means including a thermal barrier portion disposed opposite said oven cavity and a highly thermally conductive section for intimately embracing a predetermined length of said plastic pipe, said heat-sinking clamp means being adapted to sharply limit the axial heat penetration from said oven into said plastic pipe and a forming station having a die for embossing a sanitary flow pipe contour parting surface on said pipe end.

4,398,880

PROOFER TRAY ASSEMBLY HAVING STEPPED RELEASE COATING RETAINING SURFACES

Samuel O. Seiling, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,989
Int. Cl.³ A21C *7/04, 9/08*
U.S. Cl. 425—439 **7 Claims**



1. A tray assembly for use with a proofer wherein the tray assembly includes a support mechanism having two spaced rods and a pivotal axis disposed transverse to the direction of movement of a proofer conveyor comprising:

a tray carried by the rods with its planar surface normally disposed in a horizontal position; and

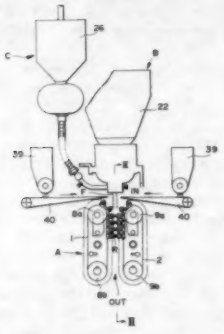
at least one dough holding cup whose side wall extends downwardly from said planar surface between said rods,

the cup sidewall having a stepped configuration with a plurality of ring sections arranged generally parallel to the planar surface of the tray to form ledges for retaining a dough release agent which facilitates the dropping of the dough from the cup when the tray support mechanism is pivoted.

4,398,881
APPARATUS FOR FORMING SOFT FOOD MATERIAL INTO GLOBULAR SHAPE

Masao Kobayashi, 38-9, 3-Chome, Ninomiya, Fukui-Shi, Fukui-Ken, Japan

Filed May 12, 1982, Ser. No. 377,557
Claims priority, application Japan, May 13, 1981, 56-72499; Aug. 27, 1981, 56-134916; Oct. 3, 1981, 56-157743
Int. Cl.³ A21C 3/04, 7/04, 11/16
U.S. Cl. 425—235 8 Claims



1. An apparatus for forming soft food material into globular shape comprising:

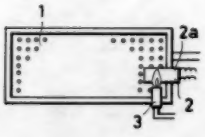
(a) a pair of endless moving means disposed so as to join with each other at one position and to part from each other at the other position after keeping the joining condition, the said pair of endless moving means including a plurality of crossing members mounted thereon and adapted for creating formation chambers in the form of pipe when the said pair of endless moving means join with each other; and

(b) means for horizontally reciprocating the said pair of endless moving means in the opposite directions to each other vertically intersecting the direction of the said pair of endless moving means, thereby reciprocating the inner walls of the said formation chambers in the opposite directions to each other so as to form the said material into globular shape.

4,398,882
COMBUSTION SAFETY APPARATUS

Toshifumi Yamana, Kasugai, Japan, assignor to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 25, 1980, Ser. No. 181,226
Claims priority, application Japan, Sep. 1, 1979, 54-112262
Int. Cl.³ F23N 5/24
U.S. Cl. 431—76 4 Claims

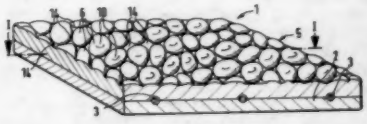


1. A combustion safety apparatus of the type having a main burner in front thereof, with a combustion detecting element such as an oxygen concentration cell element or the like, the element having a first and second electrode, the first electrode thereof is always heated by a flame of a standing burner and is brought into lack of oxygen condition while the second electrode thereof is heated by the main burner, so that when the main burner is in its complete combustion condition, a difference in oxygen concentration between the two electrodes is formed to generate an output at the element; the main burner in its incomplete combustion condition has a decrease in oxygen concentration difference between the two electrodes and thereby the output at the element is lowered, and a safety device such as a gas safety valve or the like, arranged to be controlled in operation by the output of the element whereby: the element is formed into a long plate having a longitudinal axis, said plate being positioned such that said axis is disposed to extend nearly at a right angle to a center axis of the flame of the standing burner, said center axis being the longitudinal axis of the flame.

4,398,883
PACKAGING MACHINE

Artur Vetter, and Emmerich Medwed, both of Wolfertschwenden, Fed. Rep. of Germany, assignors to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,344
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 8007088[U]
Int. Cl.³ F24J 3/00; D06F 75/08
U.S. Cl. 432—225 5 Claims

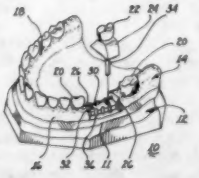


5. A packaging machine having at least one station in which a packaging foil of thermoplastic material is heated to its thermoplastic state by contacting one surface of said foil with the heating surface of heating means, wherein said heating surface comprises spaced, parallel, longitudinally-extending protrusions having relatively broad top surfaces and generally convex side surfaces between which there are channels with which the side surfaces merge characterized such that the distance between two successive protrusions is within a range of substantially 3 to 10 millimeters, preferably 5 to 8 millimeters, and the height of the protrusions above a comon plane defined by the bottoms of the channels is preferably 0.1 to 0.5 millimeters.

4,398,884
DENTAL MODEL

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Continuation of Ser. No. 86,276, Oct. 19, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,161
Int. Cl.³ A61C 19/00
U.S. Cl. 433—74 3 Claims



1. A dental model for maintaining a removable model tooth in registration within a die mounted upon a base of a dental model, said dental model comprising in combination:

(a) a pin attached to and extending from the model tooth for

guiding the model tooth into a seated relationship with the die upon the base;

(b) an elongated insert extending commensurate with a plurality of model teeth and rigidly set in said base, said insert extending into both the base and the die on either side of a line of demarcation therebetween, said insert including:

i. an upper section extending commensurate with the length of said insert, said upper section being releasably connected to the die and extending above the line of demarcation;

ii. a lower section extending commensurate with the length of said insert, said lower section depending from said upper section into the base and fixed therein below the line of demarcation to maintain structural continuity of said insert despite saw cuts made therein to a depth below the line of demarcation to isolate a model tooth within the die; and

iii. a series of cylindrical passageways one of which slidably receives said pin for maintaining the alignment of said pin during engagement and disengagement of the model tooth with the die; and

(c) a series of studs formed as part of said upper section of said insert, at least one stud positioned next to each of said passageways and extending upwardly into and releasably registering with corresponding cavities formed in the die and the model tooth to ensure dimensional stability by cooperation with said passageway for registering the model tooth upon the base and with the die upon seating of the model tooth.

4,398,885

DENTAL HANDPIECE

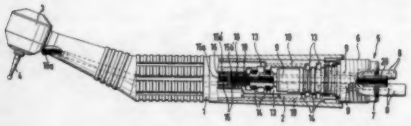
Hans Loge, Biberach, and Erich Bareth, Ummendorf, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,053

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104239

Int. Cl.³ A61C *1/08*

U.S. Cl. 433—126 **12 Claims**



1. In a dental handpiece comprising a grip sleeve; a head part provided at a first end of said grip sleeve; a drive unit comprised of an air operated turbine provided in said head part for driving a dental tool; a connecting portion arranged at the second, opposite end of the grip sleeve for free rotation relative to the grip sleeve, and releasably connected to said second end to the grip sleeve, said connecting portion being connected at its opposite end to a supply tube for supplying operating media, such as compressed air and/or water, to the headpiece; first through-flow channels provided in said connecting portion for the conveyance of the media through the connecting portion, terminating respectively in outlet apertures and extending into annular channels, which are sealed one from each other and from which there proceed second media through-flow channels provided in the grip sleeve and communicating with said first channels for all rotational positions of the connecting portion relative to the grip sleeve; and an elongate photoconductive device extending generally longitudinally of the grip sleeve and leading out near said head part to provide illumination in the region of the dental tool such that the elongate photoconductive device extends at least partly within the grip sleeve and ends in the axis of rotation of the connecting portion at the tool-side end of the connecting piece; and a light dispensing element which extends within the connecting portion and is located, at its end at the grip sleeve, substantially on the axis of rotation of the connecting portion so that light can be transmitted along the photoconductive device for all rotational positions of the connecting portion relative to the grip sleeve, the improvement comprising:

a. said first media through-flow channels in the area of their outlet apertures being radially directed and the sealing of the annular channels one from each other being by means of sealing annuli mounted in annular grooves of the connecting portion, situated on both sides of the outlet apertures;

b. the releasing of the connecting portion from the grip sleeve being by socket-connection, the holding members of the socket-connection being by means of said sealing annuli;

c. said sealing annuli also functioning as bearings which support and allow rotation of the connecting portion relative to the grip sleeve;

d. the supply tube having a tube end which is releasably connected to the connecting portion; and

e. the light dispensing element near the supply tube end of the connecting portion being provided with one or more connecting elements for releasable connection of the light dispensing element to the supply tube, said light dispensing element also including an electrically operated bulb, and a plug socket set into one end of said connecting portion to receive a plug element provided on said bulb, and a cap threaded to one end of the connecting portion to shield said bulb, and electrical lines for said bulb which extend from said plug socket at said one end of said connecting portion through said connecting portion, and said connecting elements being provided adjacent to an end of said connecting portion and connected to said electrical lines, and air supply and air exhaust ducts for said turbine being provided in the handpiece, and in which said air exhaust duct is used to accommodate said electrical lines, and wherein said connecting elements are designed as contact annuli, which are arranged parallel to each other and at a distance from each other on a turbine air outlet exhaust stack and are designed to be sealed in relation to the latter and can be brought into connection with corresponding connecting contacts provided on the end of said supply tube.

4,398,886

ROTATABLE SOCKET FOR A DENTAL HANDPIECE

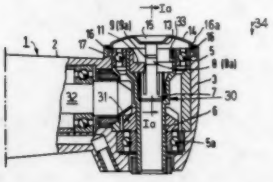
Werner Schuss, Heppenheim, and Johann Hain, Laudenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,285

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040537

Int. Cl.³ A61C *1/14*

U.S. Cl. 433—128 **12 Claims**



1. In a rotatable socket for supporting a tool for rotation in a head housing of a dental handpiece, said socket having a bore for receiving a tool from one end, catch means for releasably retaining a tool in said bore, said catch means includes at least one catch member having a free end movable radially between a locking position engaged in the recess for retaining the tool in the bore of the socket and an unlocking position for releasing

the tool, and a thumb actuated purchase disposed on the head housing, said purchase upon actuation engaging each catch member to radially move it to the unlocking position to allow removal of the tool from the socket, the improvements comprising the purchase having a pressure surface with an inclined portion of a predetermined shape and movable from a position disengaged from the free end of each catch member to a position engaging the free end of each catch member to cause radial movement to the unlocking position, a cover member having a peripheral edge, and means for rigidly securing the peripheral edge of the cover member to the head housing, said cover member having an elastically deformable portion movable through a stroke when pressure is applied to the purchase, so that upon applying pressure to the cover member, the deformable portion moves through the stroke to cause the pressure surface to engage the free end of each catch member and to move it radially to the unlocking position.

4,398,887

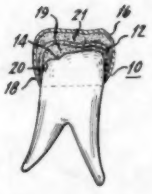
DENTAL CROWN ASSEMBLY

John W. Balde, 35 Meadow La., Flemington, N.J. 08822, and Irvin Vine, 32 Lafayette Rd., West Princeton, N.J. 08540

Continuation of Ser. No. 126,040, Feb. 29, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,803

Int. Cl.³ A61C 5/08

U.S. Cl. 433—218 **7 Claims**



1. A two-piece dental crown assembly adapted to be hand-tool shaped and conformed, in situ, to the shape of a tooth to be capped, characterized as comprising a shallow, generally cup-shaped inner member of a ductile material having one closed end adapted to be mounted on the occlusal portion of the tooth, and a deeper, generally cup-shaped outer member of a ductile material having one closed end disposed around said inner member, the side wall of the outer member being longer than that of the inner member and extending beyond the side wall of the inner member to contact and cover the side portions of the tooth when mounted on said tooth, and a bonding material between said members rigidly bonding together the closed ends thereof.

4,398,888

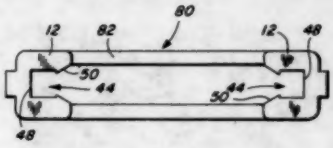
MOLECULAR MODEL FOR CHEMISTRY

Stephen D. Darling; Aloysius A. Jendrisak, both of Silver Lake, and David J. Bokmiller, Akron, all of Ohio, assignors to Tacoma Products, Inc., Tallmadge, Ohio

Division of Ser. No. 110,363, Jan. 8, 1980, Pat. No. 4,325,698. This application Nov. 12, 1981, Ser. No. 320,615

Int. Cl.³ G09B 23/26

U.S. Cl. 434—278 **1 Claim**

1. A molecular model building member comprising a first end portion, a second end portion, and two arms connecting said first end portion and said second end portion, each of said two arms being substantially symmetrical about its longitudinal axis, said first end portion and said second end portion each having an opening formed therein to receive another molecular model building member to form a model of a molecule, each of said first and second end portions having a projection formed thereon oppositely directed from said opening formed therein, said opening being provided with inwardly extending lips at the entrance thereto for engagement with the projection provided on another molecular model building member to interlock with said another molecular model building member

when received within the opening adjacent said inwardly extending lips.

4,398,889

FLIGHT SIMULATOR

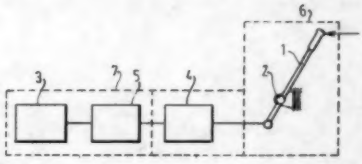
Wilhelmus J. Lam, Haarlem, and Luitzen de Vries, Amstelveen, both of Netherlands, assignors to Fokker B.V., Schiphol, Netherlands

Filed Jun. 8, 1981, Ser. No. 271,220

Claims priority, application Netherlands, Nov. 7, 1980, 8006091

Int. Cl.³ G09B 9/08

U.S. Cl. 434—45 **14 Claims**



1. A flight simulator comprising:

a flight-simulation computer,

at least one control-element,

servo-means coupled with the or each element and including an amplifier, said computer being coupled with the amplifier through an electric analog representing the relevant mechanical properties of the element concerned, characterized in that the electric analog comprises:

a divider for dividing its input signal by a value proportional to the desired mass of the element, the output of said divider being coupled with a third input of said amplifier,

a first integrator connected to the output of the divider, and

a second integrator connected to the output of the first integrator, the output of said second integrator being coupled with the input of the amplifier.

4,398,890

REPRESENTATION OF DESIGNS

Kenneth C. Knowlton, 124 Ferne Ave., Palo Alto, Calif. 94306

Filed Mar. 16, 1981, Ser. No. 243,822

Int. Cl.³ G09B 29/00

U.S. Cl. 434—96 **11 Claims**

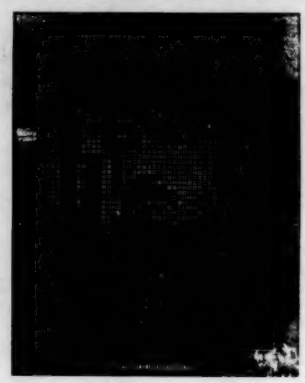
1. The method of representing a design by pattern members in the form of whole dominoes, each having two approximately square halves, which comprises the steps of:

(1) subdividing the design into a plurality of subordinate areas;

(2) assigning a value to each subordinate area in accordance with a prescribed characteristic;

(3) coordinating the assigned values with values of the pattern members, including the evaluation of the pattern members in terms of groups of the sub-areas, which are evaluated in terms of a plurality of horizontal and vertical

pairs, with a final pairing assignment made in accordance with the evaluation that enhances unbalance given by the numerical magnitudes of the difference of values of each pair of sub-areas and the pairing of sub-areas for producing maximal unblances are assigned to selective ones of the pattern members; and



(4) substituting the coordinated pattern members for the sub-areas; thereby to form a patterned representation of said design.

4,398,891

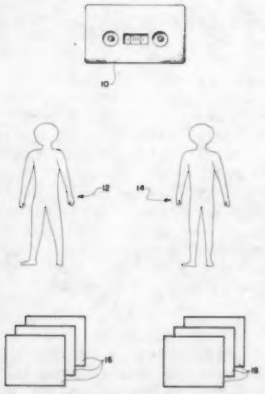
BODY RELATED TEACHING KIT

Mildred D. King, 100 Temple Dr., Knightdale, N.C. 27545

Filed Dec. 28, 1981, Ser. No. 334,558

Int. Cl.³ G09B *5/06*

U.S. Cl. 434—159 **4 Claims**



1. A body related teaching program kit for teaching children letters of the alphabet and the sounds thereof by teaching a student various parts of his or her body and teaching the student to relate various letters of the alphabet and sounds to particular parts of his or her body, said body related teaching program kit comprising: a sound recording device having playable sound rcording means for relating each letter of the alphabet to a particular part of the human body, with each letter of the alphabet representing the initial letter of a particular body part or the initial letter of a word or phrase used in an expression referring to that particular body part; at least one master human figure forming a part of said teaching program kit and having various identifiable body parts forming the same with said identifiable body parts corresponding to letters of the alphabet and respective body parts referenced in said sound recording means; an array of master cards with each master card including a respective letter of the alphabet and a pictorial representation of the body portion for which that respective letter stands for or relates to as set forth in said playable sound recording means and referenced on said master human figure; an array of drill cards with each drill card having a respective letter of the alphabet thereon that stands for or relates to a body part as set forth in said playable sound recording means and as referenced on said master human figure; and wherein there is provided a body related word representation on each of either said master cards or drill cards with said body related word representation representing a body part that is representative of an associated letter of the alphabet provided on the same card.

4,398,892

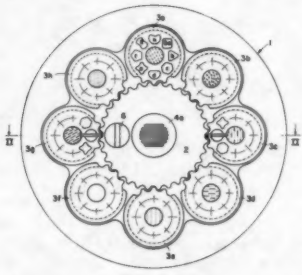
MUSICAL TOY

Arie Solomon, 49, Hasaifan St., Ramat Hasharon, Israel 47 248

Filed Nov. 18, 1981, Ser. No. 322,448

Int. Cl.³ G09B *1/06*

U.S. Cl. 434—259 **8 Claims**



1. A musical toy comprising a tone generator, a plurality of spaced apart generator contacts respectively associated with differing musical tones of a musical scale; at least one set of contactor members; at least one set of receiver members uniquely adapted to receive said set of contactor members in a fixed predetermined relative position; displacing means for displacing said receiver members whilst maintaining said fixed relative disposition in juxtaposition to said contacts so that they are successively actuated by said members in accordance with a predetermined sequence thereby generating a predetermined sequence of tones.

4,398,893

ERASABLE MAGNETIC DIAGRAMMING PANEL

Paul J. Johns, Junista, Nebr., assignor to Motion Marker Systems, Incorporated, Lincoln, Nebr.

Filed Sep. 14, 1981, Ser. No. 301,738

Int. Cl.³ G09B *19/14*

U.S. Cl. 434—305 **55 Claims**

1. A panel for diagramming adapted for selective positioning in one of a substantially vertical and horizontal position comprising:

a flat diagramming area adapted to serve as a symbol piece holding means for holding symbol piece means;

means for mounting said flat diagramming area in a substantially vertical position;

said flat diagramming area including first and second spaced-apart plates;

said first plate being a rear plate including a ferromagnetic

backing having ferromagnetic characteristics across its area;

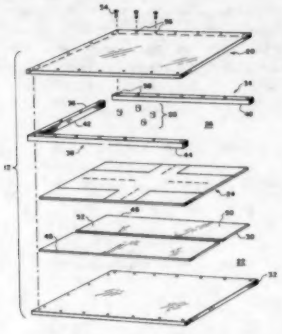
means for mounting a design sheet between said first and second plates;

said second plate being transparent, whereby the design on said design sheet may be viewed from the front of said diagramming panel;

spacer means for mounting said first and second plates at predetermined distance from each other;

magnetic symbol piece moving means for moving symbols within said first and second plates by moving said symbol means across the surface of said first plate;

said magnetic symbol piece moving means including a positioning magnet;



magnetic symbol piece means movable in response to said magnetic moving means;

said second plate being sufficiently smooth and flat to receive marks;

one of said first plate and design sheets having a first surface and one of said design sheets and second plate having a second surface;

said first and second surfaces facing each other and being spaced from each other; and

the static coefficient of friction between the contacting surfaces of each symbol piece means and the symbol piece holder means multiplied by the square of the flux density linking the symbol piece means and the ferromagnetic backing multiplied by the area of the linkage by flux being at least equal to the weight of the symbol piece means.

4,398,894

METHOD FOR QUANTITATIVELY DETERMINING THE DEGREE OF AGGLUTINATION OF PARTICLES

Hiroshi Yamamoto, Uji, Japan, assignor to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan

Filed Jun. 8, 1981, Ser. No. 271,386

Claims priority, application Japan, Jun. 12, 1980, 55-79821

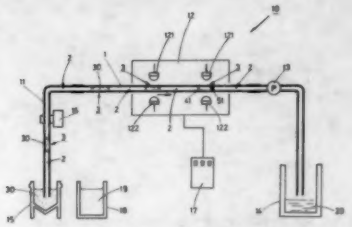
Int. Cl.³ G01N *33/54, 35/08, 21/85, 21/03*

U.S. Cl. 436—517 **10 Claims**

1. A method for quantitatively determining the degree of agglutination of particles, which comprises the steps of:

causing a liquid containing the particles to be agglutinated to slowly transfer through a small tube in the form of a vacuole within a fluid immiscible with said liquid;

allowing the particles in said liquid to agglutinate and to accumulate as agglutinated clots on the front part of said vacuole, thereby to form within said vacuole an accumulation layer of said agglutinated clots and a suspension layer of non-agglutinated particles; and



measuring the degree of agglutination within said liquid by the use of optical means after the lapse of a predetermined time.

4,398,895

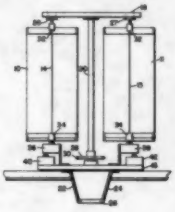
WIND PROPULSION DEVICES

Gunnar C. F. Asker, 60 E. 42nd St., New York, N.Y. 10017

Filed May 14, 1981, Ser. No. 263,366

Int. Cl.³ B63H *13/00*

U.S. Cl. 440—8 **16 Claims**



12. In windpower energy converting means, a mast-like central support for an upper horizontal and lower horizontal cross beam, each cross beam centrally fixed to said central support, said central support and cross beams forming a frame supporting a pair of rotors, pivotal mounting means for said central support allowing conjoint rotation of said central support and cross beams about the longitudinal axis of said central support an independently rotatable cylindrical rotor disposed on opposite sides of said central support and supported intermediate said upper and lower cross beams, and controllable motor means for driving each of said rotors at a selected speed and rotational direction.

4,398,896

METHOD OF DE-BURRING AND CLEANING ELECTRODE SYSTEMS

Willem M. Van Alphen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, Tarrytown, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,994

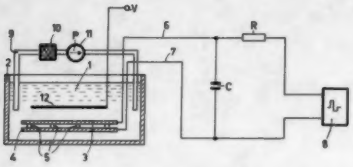
Claims priority, application Netherlands, Jun. 27, 1978, 7806868

Int. Cl.³ H01J *9/00*

U.S. Cl. 445—5 **7 Claims**

1. In a method of manufacturing an electrode system having at least two conductors positioned at a predetermined distance from each other by means of insulation material, wherein burrs on the facing parts of said conductors are removed by an arc out process and wherein an electric potential is applied between the conductors, said potential being sufficiently large to produce an electric flash-over between the conductors the improvement comprising immersing the electrode system in a

dielectric liquid with the conductors to be arced out situated below the liquid level of the dielectric liquid and then applying



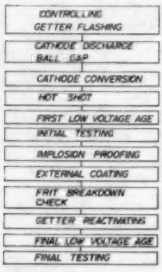
said potential between said conductors for generating an electric flash-over between the conductors.

4,398,897

METHOD OF PROCESSING A CATHODE-RAY TUBE FOR ELIMINATING BLOCKED APERTURES CAUSED BY CHARGED PARTICLES

Jawdat I. Nubani, Clarks Summit, and Frank S. Sawicki, Scranton, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,569
Int. Cl.³ F01J *9/20*
U.S. Cl. 445—5 **7 Claims**



1. In a method of processing a cathode-ray tube comprising an evacuated envelope having therein a luminescent viewing screen, means for producing at least one electron beam for exciting said screen to luminescence, an apertured mask closely spaced from said screen and gettering means for depositing a gas-sorbing, conductive getter material film on an interior surface of said mask, the method including the step of getter flashing, followed by further processing steps, the improvement comprising

controlling said getter flashing step so that said getter means yields a primary film sufficient for gettering purposes and utilizing less than all of the available getter material, and

reactivating said getter means subsequent to at least one of said further processing steps and before a final processing step to provide a secondary film of conductive getter material on said interior surface of said mask.

4,398,898

SHOCK SUB

Robert L. Odom, Porter, Tex., assignor to Texas Long Life Tool Co., Inc., Porter, Tex.

Filed Mar. 2, 1981, Ser. No. 239,442
Int. Cl.³ E21B *17/07;* **F16F** *9/00*
U.S. Cl. 464—20 **6 Claims**

1. A shock sub for use in a drill string for absorbing longitudinal and impact loads comprising

a tubular housing adapted for connection to one part of a drill string,

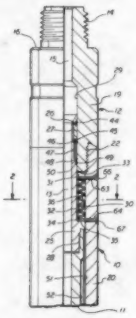
a tubular mandrel extending longitudinally into said housing for longitudinal sliding movement therein and having an end portion adapted for connection to another part of a drill string,

said housing having a smooth cylindrical inner wall surface portion with an inner diameter larger than the outer diameter of said mandrel,

said mandrel having a cylindrical surface portion defining an annular cavity inside said housing smooth cylindrical inner wall surface portion,

said mandrel having two longitudinally extending slots, positioned 90° apart circumferentially and extending substantially the entire length of said annular cavity,

a plurality of annular spring washers positioned in said annular cavity of a size having a circular opening with a sliding fit on said mandrel and circular exterior with a sliding fit inside said housing smooth cylindrical inner wall surface portion,



each of said spring washers being corrugated circumferentially in a wave configuration and having an internally extending tab of a size fitting said mandrel slots,

said spring washers being assembled on said mandrel with alternate ones having the tabs thereof fitting in one of said mandrel slots and the remaining alternate ones having the tabs thereof fitting in another mandrel slot positioned 90° from said one slot to secure said washers in circumferentially fixed relation with the troughs of one washer resting on the crests of the next adjacent washer, and

means interconnecting said mandrel and said housing permitting longitudinal sliding movement therebetween and preventing relative rotary movement comprising a plurality of longitudinal grooves in the bore of said housing, a plurality of matching grooves in the surface of said mandrel, and a plurality of cylindrical bearing members positioned between said matching grooves in said housing and in said mandrel.

4,398,899

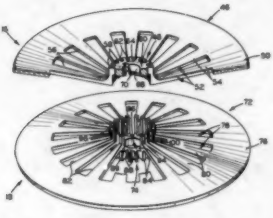
VARIABLE SPEED PULLEY

Thomas D. Wood, and Garry K. Reiss, both of Mt. Vernon, Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Oct. 23, 1981, Ser. No. 314,491
Int. Cl.³ F16H *11/04*
U.S. Cl. 474—37 **17 Claims**

1. A variable speed pulley comprising a first pulley half and a second pulley half, a shaft extending through said pulley halves with said first pulley half being mounted for rotation with said shaft and said second pulley half being slidably mounted on said shaft, said first pulley half having a shallow truncated conical portion and a central hub portion extending outwardly from said conical portion and away from said sec-

ond pulley half, said shallow conical portion having an outer rim with a circular periphery and a plurality of generally radially-extending fingers extending inwardly from said rim and narrowing in width in an inward direction, said fingers forming generally radially-extending slots therebetween and narrowing in width in an inward direction, said hub portion having a hub with a central hole for receiving said shaft, said hub portion having a plurality of upright fingers extending from inner ends of said radially-extending fingers to an outer surface of said hub, said upright fingers forming grooves therebetween around said hub and upright slots below said hub communicating with inner ends of said generally radially-extending slots; said second pulley half having a shallow truncated conical portion and a central hub portion extending outwardly from said conical portion away from said first pulley half, said shallow conical portion having an outer rim with



a circular periphery and a plurality of generally radially-extending fingers extending inwardly therefrom and narrowing in width in an inward direction, said fingers forming generally radially-extending slots therebetween and narrowing in width in an inward direction, said hub portion having a hub with a central hole for receiving said shaft, a plurality of upright fingers extending from inner ends of said generally radially-extending fingers to an outer surface of said hub, said upright fingers forming grooves therebetween around said hub and upright slots below said hub communicating with inner ends of said generally radially-extending slots; said radially-extending fingers of said first conical portion extending into said radially-extending slots of said second conical portion when said pulley halves are moved together and said upright fingers of said second hub portion extending into the grooves of said first hub portion when said pulley halves are moved together.

4,398,900

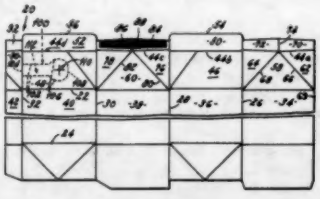
METHOD OF FORMING PAPERBOARD BLANKS FOR LIQUID CONTAINER WITH STRAW OPENING MEANS

Daniel J. Wise, Farmington, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Division of Ser. No. 47,658, Jun. 11, 1979, Pat. No. 4,244,474. This application Dec. 18, 1980, Ser. No. 217,884

Int. Cl.³ B31B *1/20*

U.S. Cl. 493—62 **2 Claims**



1. A method of forming paperboard blanks suitable for liquid carrying containers, said method including the following steps:

(a) scoring a sheet of paperboard with a network of score lines so as to form a plurality of panels suitable for forming the sides, top and bottom of said containers,

(b) cutting off individual blanks from the scored sheet such that each blank includes serially aligned first side, front, second side and rear container panels, and a side seam flap adjacent the edge of said first side panel,

(c) forming a tear strip in said first side panel by cutting at least halfway through but not all the way through said first side panel along a pair of spaced apart lines beginning at a predetermined location along said first side panel and extending across said first side panel a distance a predetermined amount greater than the overall width of said side seam flap for providing a clean, weakened area in said first side panel beyond said side seam flap when said tear strip is peeled away from said first side panel, and

(d) forming a pair of crossed lines by cuts through the inner thermoplastic material and at least halfway through said first side panel and crossing at a point substantially at the center of said pair of spaced apart lines in the area beyond the free edge of said panel extension, to thereby provide easy access for the insertion of a straw once said tear strip is peeled back to the end of said tear strip.

4,398,901

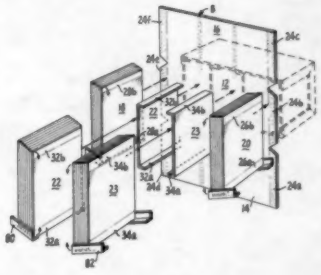
DIVIDER BOX ASSEMBLY SYSTEM

Frederick R. Campbell, Cloverdale, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Mar. 16, 1981, Ser. No. 244,447

Int. Cl.³ B31B *11/02*

U.S. Cl. 493—90 **2 Claims**



1. Apparatus for erecting and assembling a divider container at a single station from a main body blank including a bottom wall and side walls, separate end panels including end panel tabs and at least one divider panel including a main divider panel and divider panel tabs connected to opposed ends of said main divider panel, comprising:

a container-erecting station including container-erecting elements;

a main body blank receiving station adjacent to said container erecting station and including means to position a main body blank at a predetermined location relative to said container-erecting station;

two spaced end panel supply hoppers positioned adjacent to said container erecting station and spaced therefrom;

at least one spaced divider panel supply hopper positioned adjacent to said end panel supply hoppers and spaced therefrom;

a forming mandrel having a leading end and reciprocally movable between an outer position whereat the leading end is positioned on the opposite side of the main body blank-receiving station from the container-erecting station to an inner position within the container-erecting station, said mandrel including end panel receiving means for receiving end panels from said end panel supply hoppers located adjacent to said mandrel and transporting said end

panels into said container-erecting station, and said mandrel further including divider panel receiving means for receiving at least one divider panel from said divider panel supply hopper and transporting said divider panel to a location between said end panel supply hoppers and transporting at least one other divider panel from said location into said container-erecting station, said mandrel and said container-erecting elements cooperable to bend said main body blank side walls into engagement with said end panels and divider panels upon formation of said container in said container-erecting station, said apparatus additionally comprising means for bending said divider panel tabs relative to said main divider panel prior to formation of said container in said container-erecting station whereby said mandrel and said container-erecting elements are cooperable to join said divider panel tabs and said side walls in said container-erecting station, and means for bending said end panel tabs relative to the rest of said end panel prior to formation of said container in said container erecting station whereby said divider panel tabs and said end panel tabs are brought into engagement with said side walls in said container-erecting station.

4,398,902

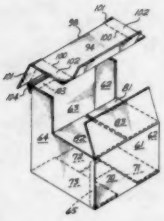
METHOD OF MAKING CONTAINER WITH HINGED COVER

Robert J. Mangum, Pearl, Miss., assignor to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 166,854, Jul. 8, 1980, abandoned. This application May 3, 1982, Ser. No. 374,651

Int. Cl.³ B31B *17/00*

U.S. Cl. 493—102 **4 Claims**



1. The method of forming a lay-flat container having a separate hinged cover fastened to a container body,

said container body comprising four walls serially joined together along a first set of score lines,

said first set of score lines defining the side edges of said walls, each of said walls having an upper free edge,

said cover comprising a fastening panel, a fold-back panel, a cover panel and a front panel serially connected by a second set of of score lines, and side panels only on said cover panel, hingedly joined to said cover panel along a third set of score lines,

said fastening panel and said front panel having a free end edge,

said fastening panel, said fold-back panel and said front panel having first free side edges, said first free side edges on each side of said fastening, fold-back and front panels being in substantial alignment,

said side panels having second free side edges which do not extend beyond said cover panel,

said method comprising

bending one wall and its adjacent wall around the one score line between them so that said one score line becomes a free side edge of said one wall,

placing said cover on the outer face of said one wall,

aligning the free end edge of said fastening panel with the upper free edge of said one wall,

aligning the corresponding first free side edge of said fastening, fold-back and front panels with said one side edge of said one wall and

fastening said fastening panel to said one wall at said wall upper edge.

4,398,903

METHOD OF AND APPARATUS FOR MAKING HANDLE BAGS

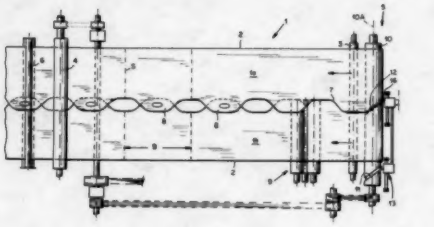
Hans Lehmacher, Im Hummerich, 5126 Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,878

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004220

Int. Cl.³ B31B *1/18, 1/86*

U.S. Cl. 493—197 **9 Claims**



1. A method of making handle bags of a predetermine bag width from an elongated synthetic-resin tube, said method comprising the steps of:

feeding said tube through a cutting station at a predetermined feed speed;

engaging a cutter through said tube at said station to subdivide said tube transversely into a pair of tube halves;

reciprocating said cutter back and forth transversely of said tube in said station at such a rate as to form on the confronting cut edges of said halves interfitting and staggered handle flaps; and

transversely seaming together each of said tubes at seams between said flaps, said tube being flattened and passed over a cutting drum at said station, said drum being formed with a circumferentially endless and undulating cutting groove, said cutter being a blade guided by said groove.

4,398,904

MACHINE FOR PRODUCING BODIES OF CONICAL RECEPTACLES

Eric W. Fagerberg, Lilla Edet, Sweden, assignor to Inlands Aktiebolag, Lilla Edet, Sweden

PCT No. PCT/SE80/00177, § 371 Date Feb. 27, 1981, § 102(e) Date Feb. 27, 1981, PCT Pub. No. WO81/00081, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 25, 1980, Ser. No. 243,905

Claims priority, application Sweden, Jul. 2, 1979, 7905763

Int. Cl.³ B31C *7/02*

U.S. Cl. 493—296 **5 Claims**

1. A machine for producing the bodies of conical receptacles having an inner annular bottom shoulder, said machine comprising

a rotatably driven shaping member having a conical jacket face,

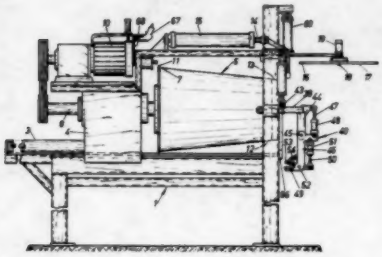
a frame supporting a web of material in the form of a narrow strip wound into a roll, which web is intended to be used to form the conical bodies of the receptacles by being wound about the shaping member,

a device adapted to releasably secure the starting end of the web of material to the smaller end of the shaping member, and

a device to effect axial displacement of the shaping member relative to the support frame during the rotation of the shaping member for the purpose of winding the web of material in helical winding turns around the conical jacket face of the shaping member while ensuring that the discrete winding turns only partly overlap in this area and adhere to each other by means of an adhesive,

a cylindrical portion provided at the smaller end of the shaping member the diameter of which portion is slightly smaller than the smallest diameter of the conical jacket face of the shaping member, characterized in that

a guide lid is arranged to be moved towards the smaller end of the shaping member so as to cover said end for the



purpose of guiding the web of material while the latter is being wound onto the shaping member,

that a pair of clamping jaws are arranged at the smaller end of the shaping member, one of the jaws being stationary while the other one is arranged for displacement towards and away from the stationary jaw to clamp the starting end of the web of material to the shaping member,

that a slit is provided in the cylindrical portion of the smaller end of the shaping member, which slit is open towards the smaller end of the shaping member so as to allow reception of the starting end of the web,

and a feeder arm arranged to introduce into the slit said starting web end to be clamped between the jaws.

4,398,905

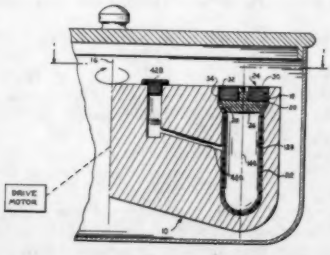
VARIABLE PRESSURE ROTOR

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1982, Ser. No. 424,475

Int. Cl.³ B04B 9/12

U.S. Cl. 494—16 **9 Claims**



1. In a centrifuge rotor of the type having a cavity adapted to receive a sample-carrying container therein, the improvement which comprises:

a well adapted to receive a predetermined volume of a liquid having a predetermined specific gravity, the well being disposed in the rotor at a location radially inwardly of the cavity; and

a passage interconnecting the well with the cavity such that when a predetermined volume of a liquid having a predetermined specific gravity is introduced into the well and the rotor is rotated, liquid moves under the influence of centrifugal force from the well through the passage and into the cavity to surround a container disposed therein and increase the hydrostatic pressure exerted on a sample carried in the container.

4,398,906

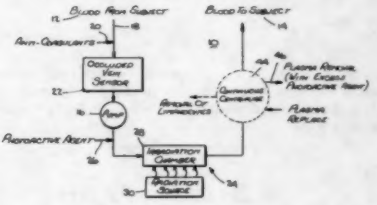
METHOD FOR EXTERNALLY TREATING THE BLOOD

Richard L. Edelson, 3 Rail Ct., Roseland, N.Y. 07068, assignor to Frederic A. Bourke, Jr.; Eleanor F. Bourke; Richard L. Edelson and The Edelson Trust, all of East Norwalk, Conn.

Continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919. This application Jun. 12, 1981, Ser. No. 272,981

Int. Cl.³ A61M 1/03

U.S. Cl. 604—6 **11 Claims**



1. A method for reducing the functioning population of a nucleated cell in the blood supply of a human subject, comprising the steps of:

withdrawing blood from said subject, and irradiating said withdrawn blood with UV radiation in the presence of from about 1 nanogram to 100 micrograms per ml of blood of a dissolved photoactive chemical agent having an affinity for the steroid receptors of the nucleated blood cell and capable when activated by said UV radiation of forming photo-adducts with said steroid receptors, to thereby effect chemical bonding between said photoactive chemical agent and said steroid receptors of the nucleated cells, thereby destroying the said receptors' ability to transmit cortisone and inhibiting the metabolic processes of said nucleated cells; and returning the irradiated blood to said subject.

4,398,907

MULTIPLE OUTLET MICROARTERIAL BRIDGE FOR DIGITAL REPLANTATION

Thomas F. Crais, 3600 St. Charles Ave., New Orleans, La. 70115

Filed Jul. 2, 1981, Ser. No. 280,064

Int. Cl.³ A61M 5/00

U.S. Cl. 604—8 **21 Claims**

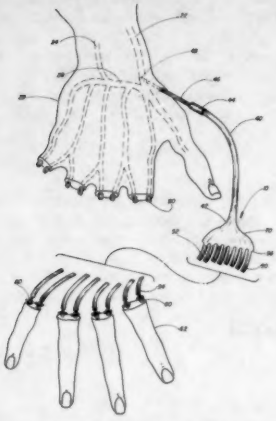
1. An apparatus for reestablishing and maintaining a blood supply to one or more severed digital arteries, comprising:

a. first elongated tubular means for conveying blood having proximal and distal end portions, said proximal end providing a needle means adapted for insertion of said proximal end into a major artery;

b. blood distribution means comprising in part a plurality of elongated tubes, each of said tubes having a proximal and distal end portion, said distal end portion adapted for insertion into an artery of a severed digit to be reestablished and maintained with blood;

c. reservoir means connecting the distal end of said tubular means with the proximal end of each of said tubes for

controlling the flow of blood from said first tubular means to said blood distribution means;



d. means associated with the distal end of each of said tubes for forming a substantially fluid-tight connection of the said tubes within each severed digital artery after insertion.

4,398,908

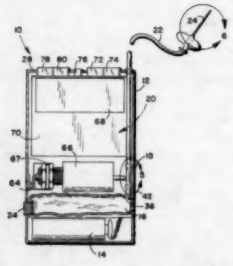
INSULIN DELIVERY SYSTEM

George G. Siposs, 2855 Velasco La., Costa Mesa, Calif. 92626

Filed Nov. 28, 1980, Ser. No. 210,780

Int. Cl.³ A61M *5/00*; F04B *43/08*; F16K *15/16*

U.S. Cl. 604—31 **16 Claims**



1. A medication delivery system comprising:

a portable housing;

a medication reservoir in association with said housing;

a repeating, valved medication pump in association with said housing and connected to said reservoir, said pump comprising:

a tube;

inlet and outlet valves in said tube, said valves allowing flow only from said reservoir to said delivery tube;

a tube support, said tube being engaged against said support between said valves;

a movable pumping blade engaging said tube opposite said support for alternately pressing and releasing said tube against said support; and

means for moving said blade, said blade having a rest position so that when said pump is inactive, said tube is closed to prevent said reservoir from draining;

a delivery tube extending from said pump so that operation of said pump draws medication from said reservoir and delivers it out of said delivery tube, said delivery tube extending from said housing for the delivery of medication to a patient; and

digital control means for said pump comprising means for producing pulses at a substantially constant pulse rate, a pulse counter connected to receive pulses from said means for producing pulses, said blade-moving means being connected to said pulse counter so that said moving means pulses for each pulse passed by said pulse counter, said pulse counter counting and passing a predetermined number of pulses from said means for producing pulses and thereafter passing no further pulses to said moving means until said pulse counter is reset.

4,398,909

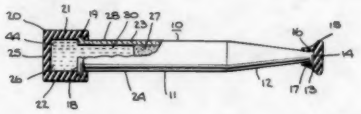
UNIT DOSE APPLICATOR

Joel B. Portnoff, 76 Gregory Pl., Richboro, Pa. 18954

Filed Dec. 31, 1981, Ser. No. 336,223

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—295 **1 Claim**



1. A unit dose applicator for the delivery of an ophthalmic medicament to the eye comprising an elongated housing having a first and second end; at the first end a nozzle having at the distal end thereof an opening, at the opposite end of the housing cap, said cap in sealing engagement with the opening and having sidewalls and an end wall, the sidewalls essentially in parallel alignment with the sidewalls of the housing at proximal end and said end wall spaced from the proximal end of the housing so that the end wall and sidewalls define a headspace, and the end wall deformable so that upon deformation inward toward the proximal end, said end wall intrudes into the headspace to displace from 1 to 6 drops from the distal end of the housing, and wherein the housing contains a medicament, said medicament adjacent the opening at the distal end and intermediate the medicament and opening at the proximal end of the housing is an impeller fluid that is inert to and immicible with the medicament.

4,398,910

WOUND DRAIN CATHETER

Larry W. Blake, 2885 Regis La., Costa Mesa, Calif. 92626; Ervin R. Harvel, 23991 Lindley, Mission Viejo, Calif. 92675; Duane R. Mason, 31 Farragut, Irvine, Calif. 92664, and George M. Wright, 24145 Puerta Deluz, Mission Viejo, Calif. 92675

Filed Feb. 26, 1981, Ser. No. 238,640

Int. Cl.³ A61M *27/00*

U.S. Cl. 604—93 **32 Claims**

1. A wound drain catheter for draining fluid form, or supplying medication to, a closed, deep wound, comprising:

a drain comprising:

a core portion having a longitudinal axis;

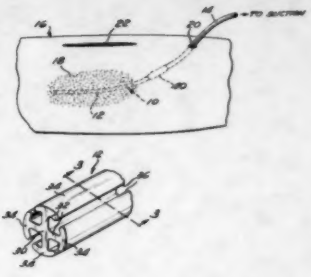
plural strut portions extending outwardly from said core portion; and

plural overhang portions, connected to the outward ends of said strut portions, respectively, said overhang portions cooperating with said strut portions to form plural longitudinal lumens, said overhang portions cooperating with each other to form, on the outer surface of said drain, the segments of a segmented, closed curve, the gaps between said segments providing plural longitudinal grooves for fluid communication between the wound and a respective one of said plural lumens, said

grooves sized to inhibit tissue from growing therein and debris from passing therethrough;

said drain formed of a material which, when placed in tension between the gripping wound tissue and a force used to withdraw said drain from said wound, will reduce sufficiently in cross-section to reduce said gripping force to facilitate withdrawal; said drain having a substantially uniform cross section throughout the portion of its' length which is placed in tension during such removal to provide means for reducing stress risers and thus preventing breakage;

a flexible outflow tube having a smooth exterior for sealing to surface tissue at the point of exit from a patient's body; and



means conforming to said segmented, closed curve, for connecting said outflow tube to said drain.

4,398,911

TANNING METHOD

Max May, Bottmingen, Switzerland; Rolf Monsheimer, Darmstadt, and Ernst Pfleiderer, Darmstadt-Arbeilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 169,847, Jul. 17, 1980, abandoned. This application Mar. 3, 1982, Ser. No. 354,202

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930342

Int. Cl.[3] C14C *11/00, 1/04, 1/06, 1/08*

U.S. Cl. 8—94.16 5 Claims

1. In a process for the preparation of leather from skins or hides, which process includes beamhouse method steps for the preparation of dehaired hides ready for tanning as well as the subsequent method steps of tanning and dressing said dehaired skins or hides, the improvement wherein a cellulose ether is added to the treating bath used in at least one of said method steps.

4,398,912

CYCLICAL TENSIO-ACTIVE POLYETHERS

Guy Vanlerberghe, Claye-Souilly, and Henry Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

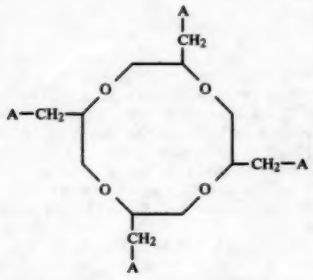
Division of Ser. No. 20,656, Mar. 15, 1979, Pat. No. 4,297,102. This application Jul. 30, 1981, Ser. No. 288,361

Claims priority, application France, Mar. 17, 1978, 78 07914

Int. Cl.[3] A61K *7/13;* C07D *323/00;* C11D *1/755, 1/75*

U.S. Cl. 8—405 23 Claims

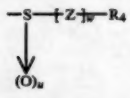
1. Cyclical tensio-active polyethers of the general formula:



(I)

in which A is an amphiphile grouping selected from the group consisting of:

(e) the grouping:



where R_4 refers to an alkyl radical having from 6 to 20 carbon atoms, u refers to 0 or 1, w refers to 0 or 1, and Z refers to a grouping of atoms with hydrophile characteristics selected from the group consisting of:

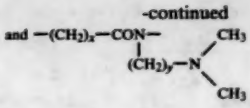
$-CH_2-CHOH-$, $-(CH_2-CH_2O)_n-$,

$-(CH_2-CH_2O)_n-C(=O)-$, $-(CH_2)_x-COO-$,

$-(CH_2)_x-COOCH_2-CHOH-$, $-(CH_2)_x-CONH-$,

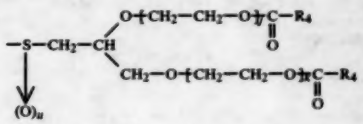
-continued

and



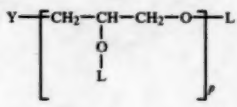
where x represents 1 or 2, y represents 2 or 3, and n represents a number from 1 to 20;

(e_1) the grouping:



where each of j and k refer to a whole number or a fraction lower than 20, the sum j+k being between 1 and 20, u refers to 0 or 1, and R_4 refers to an alkyl radical having from 6 to 20 carbon atoms;

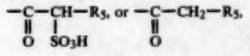
(f) the grouping:



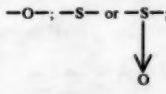
where L refers to a hydrogen atom and one of the groupings:

$-CH_2-CHOH-CH_2-(O)_q-R_5$

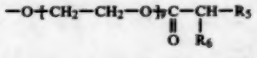
where q refers to 0 or 1,



the hydrogen atom and the other grouping being distributed is statistical fashion, R_5 refers to a linear alkyl radical having from 6 to 18 carbon atoms, p refers to a whole number or a fraction from 1 to 10 and represents an average statistical value, and Y refers to:



(g) the grouping:



where v refers to a whole number or a fraction from 0 to 20, R_6 refers to a hydrogen atom or the radical $-SO_3H$, and R_5 has the meaning indicated above;

(h) the grouping (e) or (e_1) wherein the thioether or sulphoxide grouping, or the tertiary amine grouping for (e) is alkylated by an alkylation agent selected from the group consisting of methyl bromide, methyl iodide and dimethyl sulphate; and

(i) the grouping (f) wherein the thioether or sulphoxide grouping of (f) is alkylated by an alkylation agent selected

from the group consisting of methyl bromide, methyl iodide and dimethyl sulphate.

4,398,913

PROCESS FOR PRODUCING DISCHARGE RESERVE PRINTS ON TEXTILE MATERIALS

Ulrich Buhler, Schoneck; Joachim Ribka, Offenbach am Main; Kurt Roth, Hofheim, and Theo Stahl, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

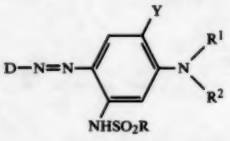
Filed Sep. 21, 1981, Ser. No. 304,099

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042144

Int. Cl.³ D06P 5/12

U.S. Cl. 8—456 **12 Claims**

1. In the process for production of discharge reserve prints on textile material comprised of water-repellent fibers or water repellent fibers mixed with cellulose fibers, wherein a disperse dyestuff which is dischargeable to white is applied in the form of a dye liquor or printing paste to the incipiently dried, and a discharge reserve printing paste is printed on the material in the desired pattern, and the thus treated material is subsequently subjected to a heat treatment at temperatures of 100° to 230° C. and wherein said disperse dyestuff which is dischargeable to white is a dyestuff of the formula



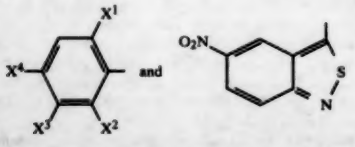
wherein R is unsubstituted or substituted alkyl having 1 to 4 carbon atoms which when substituted is substituted by hydroxyl, chloro, bromo, methoxy, methoxyethoxy or ethoxyethoxy or R is phenyl or phenyl substituted by at least one of nitro, chlorine, bromine and methyl;

R^1 is alkyl having 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxyl, chloro, bromo, cyano, phenyl, phenoxy, alkylaminocarbonyloxy having 1 to 4 carbon atoms in the alkyl moiety or phenylaminocarbonyloxy, or R^1 is dihydroxyalkyl having 3 or 4 carbon atoms, chlorohydroxyalkyl having 3 or 4 carbon atoms, or alkyl having 3 to 10 carbon atoms with the carbon chain interrupted by 1 to 3 oxygen atoms and which is unsubstituted or substituted by at least one hydroxyl;

R^2 is independently a moiety as defined for R^1 or R^2 is hydrogen, cyclopentyl, cyclohexyl, phenyl, or alkenyl having 3 to 5 carbon atoms;

Y is hydrogen, chloro, bromo, alkyl having 1 to 4 carbon atoms, alkoxy which has 1 to 4 carbon atoms which is unsubstituted or substituted by cyano or hydroxyl, or Y is dihydroxyalkoxy having 3 or 4 carbon atoms, chlorohydroxyalkyl having 3 or 4 carbon atoms, or alkoxy having 3 to 10 carbon atoms with the carbon chain interrupted by 1 to 3 oxygen atoms and which is unsubstituted or substituted by hydroxyl;

D is a moiety selected from the group consisting of



wherein X^1 nitro, cyano, alkylsulphonyl having 1 to 4 carbon atoms, phenylsulphonyl, dialkylphosphono having 1 to 4 carbon atoms in each alkyl moiety or trifluoromethyl;

X^2 is nitro, cyano, alkylsulphonyl having 1 to 4 carbon atoms, phenylsulphonyl, dialkylphosphono having 1 to 4 carbon atoms in each of alkyl moiety, bromo, chloro or fluoro;

X^3 is hydrogen, chloro, bromo, fluoro or nitro;

X^4 is hydrogen, chloro, bromo, fluoro, methyl, ethyl, nitro, cyano, alkylsulphonyl having 1 to 4 carbon atoms, phenylsulphonyl, trifluoromethyl, aminocarbonyl, alkylaminocarbonyl having 1 to 4 carbon atoms in the alkyl moiety and which is unsubstituted or substituted by hydroxyl, alkylaminocarbonyl having 3 to 10 carbon atoms in the alkyl moiety and which is interrupted by up to 3 oxygen atoms, dialkylaminocarbonyl having 1 to 4 carbon atoms in each alkyl moiety which is unsubstituted or substituted by hydroxyl, dialkylaminocarbonyl having 3 to 10 carbon atoms in each alkyl moiety and which are interrupted by up to 3 oxygen atoms, aminosulphonyl, alkylaminosulphonyl having 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxyl, alkylaminosulphonyl having 3 to 10 carbon atoms and with the carbon chain interrupted by up to 3 oxygen atoms, dialkylaminosulphonyl having 1 to 4 carbon atoms in each of the alkyl moieties, dialkylaminosulphonyl having 3 to 10 carbon atoms in each alkyl moiety, with each of which interrupted by up to 3 oxygen atoms, alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety, phenylcarbonyl unsubstituted or substituted by at least one of nitro, chloro, bromo, methoxy or methyl, with the proviso that not more than 3 of X^1 to X^4 are nitro or cyano,

the improvement comprising said discharge reserve printing paste containing, as the discharging agent, a base which produces a pH value of at least 8 in a 5% strength aqueous solution.

4,398,914

PROCESS FOR DISCHARGE OR RESERVE PRINTING ON SYNTHETIC FIBERS: FORMALDEHYDE SULFOXYLATE AND HEXAMETHYLENE TETRAMINE

Adolf Blum; Peter Kutschera, and Guenther Vogl, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,740

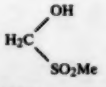
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106036

Int. Cl.³ D06P 5/15

U.S. Cl. 8—456 **10 Claims**

1. In a process for disperse dyeing of a synthetic fabric with dispersion dyes by the discharge or discharge-resist method wherein said fabric is padded or printed respectively with a padding liquor or printing paste containing at least one dischargeable dye; said fabric is dried under conditions which do not result in fixation of the dye, or alternatively said fabric is dried under conditions which result in fixation of the dye; said fabric is printed with a mixture comprising a discharge agent, or alternatively a discharge agent and at least one discharge-resistant dispersion dye; and said dischargeable dispersion dyes are fixed, or where contacted by said discharge agent, destroyed; the improvement wherein said discharge agent comprises a mixture of

(A) about 5 to about 50 parts by weight of a compound having the formula:



wherein Me is selected from the group consisting of sodium, potassium, ammonium and alkyl-substituted ammonium groups, or an ammonia derivative derived from

the reaction of ammonia or of an ammonium derivative containing at least one hydrogen atom bonded to the nitrogen with alkali metal or an ammonium salt of methane sulfinic acid,

(B) about 5 to about 50 parts by weight of hexamethylene tetramine, and

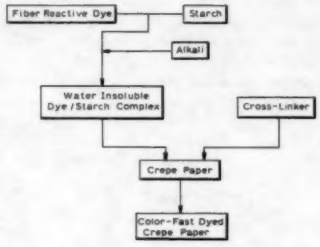
(C) 0 to about 20 parts by weight of anthraquinone.

4,398,915

BLEED RESISTANT COLORED CELLULOSICS AND THE METHOD OF THEIR PREPARATION

Joseph S. Panto, Dover, and Ernest R. Kaswell, Waban, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Jan. 6, 1982, Ser. No. 337,410
Int. Cl.³ C09B *62/00*
U.S. Cl. 8—543 **7 Claims**



1. A method of coloring preformed cellulosic materials, which comprises; chemically cross-linking a water-insoluble colorant particle to the cellulosic material, said colorant particle being the reaction product of starch bearing substituent groups reactive with acid halides, and a reactive dye compound.

4,398,916

PROCESS FOR PURIFICATION OF QUINOLINE YELLOW

Nicholas A. Ambrosiano, Cincinnati, Ohio, and James E. Kassner, Fort Mitchell, Ky., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,866
Int. Cl.³ C09B *67/00*
U.S. Cl. 8—602 **6 Claims**

1. A process for the purification of the dye Quinoline Yellow WS wherein the purified dyestuff contains not more than 0.2 percent of sulfonated quinaldines, not more than 0.2 percent of sulfonated phthalic acid, not more than 6.0 percent of chlorides and sulfates as the sodium salts and a total color content of not less than 85 percent which comprises:

(a) preparing a clarified aqueous solution at a pH in the range of 7.5 to 8.5 of technical Quinoline Yellow WS;

(b) adding to said solution at a temperature in the range of 25° to 70° C. at least a stoichiometric amount of an aqueous solution of an acid addition salt of an organic amine;

(c) separating the precipitated amine salts of the dyes;

(d) washing said separated amine salts with a lower alkanol or an aqueous solution thereof;

(e) dissolving the washed amine salts in sufficient dilute aqueous solution of sodium hydroxide to produce a pH in the range of 11.0 to 12.0 in the solution;

(f) separating the liberated amine from said aqueous solution;

(g) adjusting the aqueous solution to a pH in the range of 8.0 to 8.5;

(h) evaporating the water from the aqueous solution; and

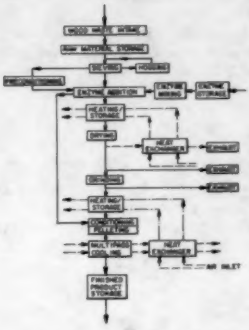
(i) optionally washing the residual Quinoline Yellow WS with a lower alkanol.

4,398,917

PROCESS FOR THE PREPARATION OF FUEL PELLETS

Charles J. Reilly, 777 E. 31st St., Brooklyn, N.Y. 11210

Filed Mar. 23, 1982, Ser. No. 360,991
Int. Cl.³ C10L *5/02*
U.S. Cl. 44—10 B **21 Claims**



1. A process for the preparation of fuel pellets comprised of, in whole or in part, at least one modified cellulosic material which process comprises the steps of:

(a) contacting a communated cellulosic material with at least one enzyme under conditions whereby said cellulosic material is modified to the extent that it is softer and more pliable and less mechanical energy is needed to form the material into said pellets,

(b) partially drying and communating said modified material,

(c) pelletizing said modified material and

(d) drying the resulting pellets to further reduce the moisture content.

4,398,918

USE OF ETHOXYLATED DIALKYL QUATERNARY AMMONIUM DERIVATIVES AS SUSPENDING AGENTS FOR COAL-OIL MIXTURES

Thomas C. Newman, Hinsdale, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 11, 1982, Ser. No. 338,781
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **11 Claims**

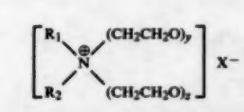
1. A fuel slurry comprising:

(a) 10 to 60 weight percent coal particles, at least 80 percent of said particles being smaller than 200 mesh;

(b) 39 to 89 weight percent liquid hydrocarbon fuel;

(c) 0.5 to 3.0 weight percent water; and

(d) 0.1 to 1.0 weight percent of a stabilizer, said stabilizer corresponding to the general formula:



wherein R_1 and R_2 are each straight or branched-chain aliphatic groups having from 8 to 22 carbon atoms, wherein y and z are integers having a value of 1 or greater, the sum of y and z being between 2 and 15, and wherein X is an anion selected from the group consisting of CH_3COO^-, Cl^-, BO_3^-, and $(CH_3)_2SO_4^-$, and wherein said slurry remains in a substantially homogeneous state when left standing without agitation for at least twenty-four hours.

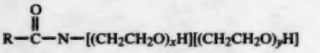
4,398,919

POLYETHOXYLATED COMPOUNDS AS COAL-WATER SLURRY SURFACTANTS

Moneeb Zakaria, Western Springs, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Nov. 4, 1981, Ser. No. 318,283
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 **10 Claims**

1. A pumpable coal and water slurry, said slurry comprising comminuted coal, water, and a surfactant corresponding to the formula



wherein R is an alkyl group having between 8 and 18 carbon atoms, x and y are each integers equal to or greater than 1, the sum of x and y is between 2 and 15, and wherein the active surfactant content of said slurry is from about 0.1 to 0.5 weight percent.

4,398,920

BLENDED FUELS CONTAINING BUTYL ALCOHOL ACETONE AND METHANOL

Jean-Claude Guibet, Saint Germain en Laye, and Jean-Paul Vandecasteele, Fourqueux, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 9, 1981, Ser. No. 271,758
Claims priority, application France, Jun. 9, 1980, 80 12822; Aug. 1, 1980, 80 17147
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 **16 Claims**

1. A blended high octane automotive fuel, comprising:
(a) 90–96% by weight of a premium hydrocarbon gasoline;
(b) 1–10% by weight of a mixture of butanol and acetone, 40–85% by weight of said mixture being butanol and 15–60% by weight being acetone; and
(c) 3–10% by weight of methanol wherein the sum of (b) and (c) is at most 100%-(a).

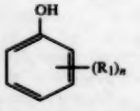
4,398,921

GASOHOL COMPOSITIONS

Ellis B. Rifkin, Southfield; Martin E. Gluckstein, Detroit, and Warren L. Perilstein, Orchard Lake, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,571
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 **6 Claims**

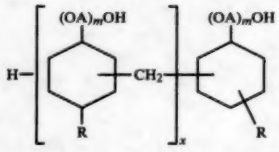
1. A liquid fuel for use in internal combustion engines comprising from about 70 to about 90 volume percent hydrocarbons boiling in the gasoline boiling range, from about 5 to about 30 volume percent ethanol and a detergent amount of an additive comprising:
(I) from about 20 to about 40 weight percent of the reaction product of:
(A) one mole part of an alkylphenol having the formula:



wherein n is an integer from 1 to 2, and R_1 is an aliphatic hydrocarbon radical having an average molecular weight of from about 400 to 1500;
(B) from 1–5 mole parts of an aldehyde having the formula:

wherein R_2 is selected from hydrogen and alkyl radicals containing 1–6 carbon atoms; and
(C) from 0.5–5 mole parts of an amine having at least one active hydrogen atom bonded to an amino nitrogen atom, and
(II) from about 3.0 to about 6.0 weight percent of a demulsifying agent containing:
(A) at least one oil-soluble polyether characterized by the presence within its structure of a group of the formula:

wherein A is an alkylene group containing from 2 to about 7 carbon atoms and where x has an average value of from about 5 to about 200; and
(B) an oxyalkylated phenol formaldehyde resin of the formula:



wherein A represents an alkylene group containing from about 2 to about 10 carbon atoms, where m has an average value of from about 4 to about 200, and where R is an alkyl group of about from 1 to about 20 carbon atoms, and x is an integer greater than 1,
(III) from about 40 to about 70 weight percent of a mononuclear or dinuclear aromatic hydrocarbon solvent, and
(IV) from about 5.0 to about 15.0 weight percent of a corrosion inhibitor selected from a hydrocarbyl succinic acid or anhydride having from 12 to 30 carbon atoms (50% oil).

4,398,922

EXTRACTIVE BLENDING PROCESS

Susan A. Bezman, Point Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

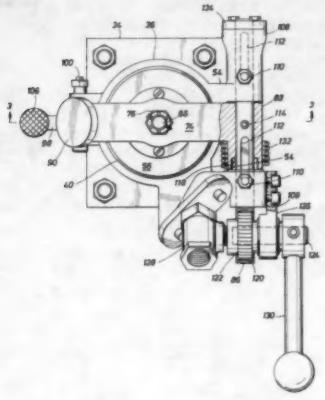
Filed Jun. 25, 1981, Ser. No. 277,295
Int. Cl.³ C10L 1/02
U.S. Cl. 44—56 **4 Claims**

1. A process for blending isopropanol from an aqueous isopropanol solution into gasoline comprising the steps of:
(a) mixing at atmospheric pressure an aqueous solution of isopropanol having an isopropanol content of greater than about 50% with gasoline at a volume ratio of gasoline to isopropanol solution of at least 2:1;
(b) allowing the mixture to separate into two phases, an organic phase which consists essentially of the gasoline and the isopropanol and an aqueous phase which consists essentially of water; and
(c) recovering the organic phase.

4,398,923
VESSEL ACCESS PORT

Norman J. Hannigan, Katy, Tex., assignor to BS&B Engineering Company, Inc., Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,573
Int. Cl.³ C10J 3/72
U.S. Cl. 48—87 9 Claims



1. An access port structure for a vessel having an opening therethrough comprising,

means secured to said vessel surrounding the vessel opening and defining a seat,

a closure plate,

means supporting said closure plate for movemement into engagement with said seat and away from said seat,

means for creating a vortex extending into said vessel through said opening,

means supplying steam to said vortex creating means, valve means in said supply means, and

means interconnecting said closure plate and said valve means assuring opening of valve means prior to opening said closure plate.

4,398,924
SULFUR OXIDE REDUCTION IN A COAL GASIFICATION PROCESS

C. Richard Hsieh, San Rafael, and Paul T. Roberts, Alameda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 3, 1981, Ser. No. 327,009
Int. Cl.³ C10J 3/46, 3/54
U.S. Cl. 48—202 8 Claims

1. In the coal gasification process comprising:

(a) introducing a coal containing sulfur and a heat transfer material into a reaction vessel;

(b) passing steam through said vessel to react with said coal to form a hot char and a gaseous product, whereby hydrogen sulfide is released from the coal and wherein the heat necessary for said reaction is supplied by the heat-transfer material;

(c) removing the heat-transfer material from said vessel;

(d) introducing at least a portion of the heat-transfer material into a combustion zone;

(e) removing the hot char, the gaseous product and the hydrogen sulfide from the vessel, separating the hot char from the gaseous product and the hydrogen sulfide, and introducing at least a portion of the hot char into the combustion zone;

(f) heating the heat-transfer material to an elevated temperature in said combustion zone by combusting the char with air, thereby releasing sulfur oxides, and contacting the heat-transfer material with the combusted char; and

(g) recycling at least a portion of said heat-transfer material to said reaction vessel as a source of heat-transfer material;

the improvement comprising a method of reducing said sulfur oxides comprising

(1) absorbing onto a regenerable sorbent the sulfur oxides released in the combustion zone;

(2) transferring said regenerable sorbent to the reaction vessel;

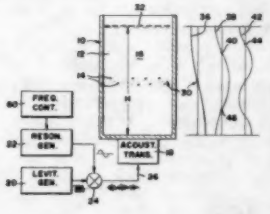
(3) releasing the sulfur oxides from the regenerable sorbent in the reaction vessel in the form of hydrogen sulfide; and

(4) recycling the regenerable sorbent to the combustion zone to absorb further sulfur oxides in step (2).

4,398,925
ACOUSTIC BUBBLE REMOVAL METHOD

Eugene H. Trinh, Los Angeles; Daniel D. Elleman, San Marino, and Taylor G. Wang, Glendale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1982, Ser. No. 341,406
Int. Cl.³ B01D 19/00
U.S. Cl. 55—15 10 Claims



1. A method for removing gas bubbles, including larger bubbles and smaller bubbles, from a bath of liquid, comprising:

first removing the larger bubbles by applying acoustic energy of a mode which is resonant to a bath dimension to drive bubbles toward a pressure well of the mode to at least partially coalesce them so as to form the larger bubbles, and then removing the coalesced larger bubbles;

thereafter dissolving the smaller bubbles that remain in the liquid of the bath, by applying acoustic energy of frequencies which are resonant to the smaller bubbles to create bubble oscillations and consequent microscopic stirring of liquid immediately around the smaller bubbles.

4,398,926
ENHANCED HYDROGEN RECOVERY FROM LOW PURITY GAS STREAMS

Kishore J. Doshi, Mahopac, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 23, 1982, Ser. No. 371,285
Int. Cl.³ B01D *53/04, 53/22*
U.S. Cl. 55—16 **15 Claims**

1. An improved pressure swing adsorption process for the separation and purification of hydrogen contained in a high pressure feed gas stream comprising:

(a) passing said feed gas stream having a hydrogen content of up to about 90 mol % at a feed gas pressure in excess of about 600 psig into a separator containing a gas permeable membrane capable of selectively permeating said hydrogen;

(b) withdrawing the non-permeate portion of said gas stream from the separator essentially at the feed gas pressure, said non-permeate gas containing a substantial portion of said impurities;

(c) withdrawing the hydrogen-rich permeate gas from the separator at a reduced pressure;

(d) passing said hydrogen-rich permeate gas as a feed gas at said reduced pressure to the feed end of an adsorbent bed capable of selectively adsorbing impuritied from said permeate gas, said bed thereby having an advancing impurity adsorption front therein, with unadsorbed, purified hydrogen product gas being withdrawn from the product end of the bed;

(e) releasing void space gas from the product end of the bed, thereby cocurrently depressurizing said bed and moving said adsorption front toward said product end of the bed;

(f) countercurrently depressurizing the bed to a lower desorption pressure to desorb and release said impurities from the feed end of the bed;

(g) repressurizing said bed from the lower desorption pressure to said pressure level at which permeate gas is passed to the bed;

(h) depressurizing said non-permeate gas or a portion thereof from said feed gas pressure;

(i) passing depressurized non-permeate gas to the feed end of the adsorbent bed at said reduced pressure as a co-feed gas, prior to step (e) above; and

(j) repeating said steps (a)-(i) with additional quantities of said feed gas stream,

whereby product recovery can be enhanced at reduced operating costs.

9. An improved pressure swing adsorption apparatus for the separation and purification of hydrogen contained in a high pressure gas stream comprising:

(a) a separator containing a gas permeable membrane capable of selectively permeating said hydrogen at a separator feed gas pressure in excess of about 600 psig;

(b) means for passing said gas stream at said feed gas pressure to the feed inlet portion of said separator;

(c) outlet means for withdrawing hydrogen-rich permeate gas from the separator at a reduced pressure;

(d) outlet means for separately withdrawing the non-permeate portion of the gas stream from the separator essentially at said feed gas pressure;

(e) a pressure swing adsorption system having at least one adsorbent bed therein, said adsorbent bed having a feed end and a product end and being capable of selectively adsorbing impurities from a hydrogen-containing gas stream, said adsorption system being adapted for feed gas introduction-adsorption-hydrogen product gas discharge at said reduced pressure, co-feed with non-permeate gas, cocurrent depressurization to an intermediate pressure level, countercurrent depressurization to a lower desorption pressure, purge and repressurization to said adsorption pressure in each bed, on a cyclic basis;

(f) means for passing said hydrogen-rich permeate gas at said reduced pressure to the feed end of each bed as feed gas;

(g) means for reducing the pressure of said non-permeate gas from said separator feed gas pressure to a lower level(s); and

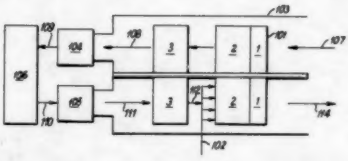
(h) conduit means for passing said non-permeate gas to the feed end of each said bed at a reduced pressure as a co-feed gas prior to said cocurrent depressurization of each said bed,

whereby the integration of the processing streams from said separator with said pressure swing adsorption system enables overall hydrogen product recovery to be enhanced at reduced operating costs.

4,398,927
CYCLIC ADSORPTION PROCESS

William J. Asher, Fanwood, and Agustin F. Venero, Berkeley Heights, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 173,475, Jul. 30, 1980, abandoned. This application Nov. 24, 1981, Ser. No. 324,463
Int. Cl.³ B01D *53/06*
U.S. Cl. 55—34 **22 Claims**



1. An improved cyclic adsorption process comprising:

passing a fluid stream containing an adsorbate to be removed therefrom through an adsorption zone and then through a heat storage zone, said fluid being passed through said adsorption zone under conditions sufficient to provide that the velocity of the heat transfer front and the velocity of the mass transfer front through said adsorption zone are substantially equal; and

regenerating said adsorbent by passing a regeneration stream through said heat storage zone and then through said adsorption zone whereby said regeneration stream is heated in said heat storage zone.

4,398,928
ELECTROGASDYNAMICALLY ASSISTED CYCLONE SYSTEM FOR CLEANING FLUE GASES AT HIGH TEMPERATURES AND PRESSURES

Laszlo Kunsagi, Upper Montclair, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 100,789, Dec. 5, 1979, abandoned. This application Sep. 10, 1982, Ser. No. 416,772
Int. Cl.³ B03C *3/00*
U.S. Cl. 55—107 **11 Claims**

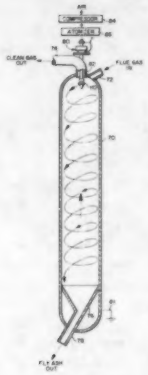
1. An apparatus for separating solid particles from a gas at high temperature and pressure comprising

a cylindrical vessel having an upper end portion, a lower end portion and an inner wall surface;

an inlet in the upper end portion for receiving the gas containing the solid particles, the inlet being directed tangentially relative to the inner wall surface of the vessel, so that the relatively large particles are driven by centrifugal forces to the inner wall surface;

means for applying an electrical charge to the remaining, relatively small particles, including a charged aerosol inlet positioned centrally at the upper end of the cylindrical vessel and means positioned at the inlet for directing the charged aerosols toward the inner wall surface of the cylindrical vessel around the entire periphery thereof below the level of the inlet for receiving the gas containing the solid particles, the directing means including a diffuser;

means for producing on the inner wall surface an electrical charge having a polarity opposite to the electric charge applied to the relatively small particles, whereby the relatively small particles are attracted to the inner wall surface and scrubbed off by the relatively larger particles moving downwardly along the inner wall surface;



an outlet located at the lower end portion of the vessel for discharging the separated particles; and

an outlet extending through the vessel for discharging the cleaned gas.

4,398,929

COMPRESSED AIR DEHUMIDIFIER

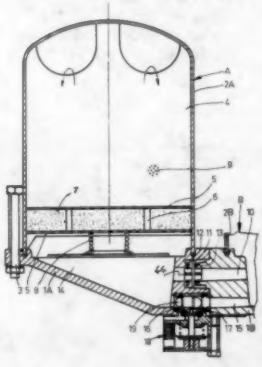
Carl R. Segersten, Malmo, Sweden, assignor to SAB Automotive AB, Landskrona, Sweden

Filed Dec. 2, 1981, Ser. No. 326,754

Claims priority, application Sweden, Dec. 9, 1980, 8008632

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—163 **4 Claims**



1. In a dehumidifier system including a compressed air dehumidifier including two containers each with an adsorbent therein and valve means for connecting the containers alternatingly one at a time into a compressed air delivery system for dehumidifying air to be delivered from an air compressor, the improvements comprising, choked bleeding means for passing a fraction of the dehumidified air from the container connected into the delivery system into the other container thereby to create a pressure difference between said two containers, and a valve control mechanism comprising,

(a) shuttle valve means having a housing and a movable shuttle valve body having two spaced recesses therein and which is axially positionable over a short movable stroke alternately between two mating seats defined in the housing so that when the containers are alternately connected into said air delivery system there is established a discharge path through one of the seats for said fraction of the dehumidified air passing through that said other container to the surrounding atmosphere, said shuttle valve body being axially movable in response to said differential of air pressure between said containers,

(b) a locking valve stem axially movable transversely to the shuttle valve body for respectively engaging one of said recesses for mechanically locking the valve body against a respective one of said seats and releasing it for movement to the other seat,

(c) means for reciprocating the valve stem axially to lock the shuttle valve into position against either one of said seats and to release the shuttle valve for axial movement of the shuttle valve into an alternate seat in response to the difference of air pressure between said two containers.

4,398,930

FLUID DEAERATION APPARATUS

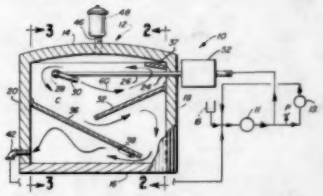
Larry A. Larson, Washington, and Brian J. Murphy, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01056, § 371 Date Aug. 7, 1981, § 102(e) Date Aug. 7, 1981

PCT Filed Aug. 7, 1981, Ser. No. 297,529

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—192 **7 Claims**



1. In a deaeration apparatus (10) for removing bubbles of gas from a fluid being circulated in a closed system, the improvement comprising:

a circulating pump (11);

closed tank means (12) for receiving and slowing the fluid containing gas, said tank means (12) having a fluid inlet (26) and a fluid outlet (42), said tank means (12) being filled with fluid to a level that covers said fluid inlet (26);

means (46) for positively venting gas from a gas space above said fluid in said tank means (12);

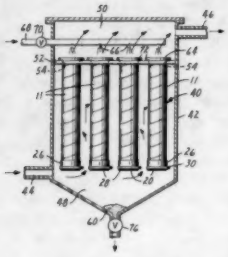
an injector pump (13) extracting a fluctuating amount of deaerated fluid from the closed system; and

pressure regulating valve means (52) for continuously inducing negative pressure waves in said fluid, said pressure regulating valve means (52) being interposed between said circulating pump (11) and said tank fluid inlet (26) and being disposed adjacent to said fluid inlet in said tank means (12), said pressure regulating valve means (52) being subjected to fluctuating pressure output from said circulating pump (11) and from said injector pump (13) causing said valve means to throttle in attempting to maintain a constant pressure, said throttling of the valve means (52) inducing said negative pressure waves in said fluid, said negative pressure waves causing dissolved gas in the fluid passing through said pressure regulating valve means (52) to oversaturate to form bubbles of entrained gas, said bubbles of entrained gas being collected and positively vented from said tank means (12) through said vent means (46).

4,398,931
CERAMIC FABRIC FILTER

Thomas S. Shevlin, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1982, Ser. No. 379,720
Int. Cl.³ B01D 46/00
U.S. Cl. 55—341 R 20 Claims



1. A filter comprising:

a rigid, tubular frame or cage made of high temperature stable material, having an upper end and a lower end, said upper end being open, said cage having openings to provide at least 40 percent open area on its lateral surface, with each opening having an area of less than 125 square millimeters, and

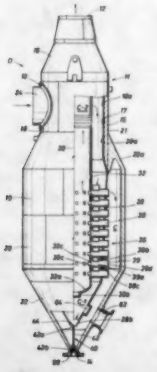
a tubular, seamless filter element surrounding said cage and comprising a conformable, fabric tape of woven ceramic fibers and tightly spiral-wound in an over-lapped wrap about the lateral surface of said cage, said filter element being a gas permeable structure having at least one open end,

the resultant filter being a gas permeable, rigid structure having at least one open end and suitable for high temperature filtering applications.

4,398,932
PARTICULATE SEPARATION DEVICE

Manfred F. Dehne, 14350 Chrisman Rd., Houston, Tex. 77039

Continuation of Ser. No. 223,788, Jan. 9, 1981, abandoned. This application Mar. 30, 1982, Ser. No. 363,448
Int. Cl.³ B01D 45/12; B04C 5/26
U.S. Cl. 55—349 14 Claims



1. In a particulate separation device, including an inner clean gas housing comprising an inner clean gas chamber, an intermediate particulate-laden housing comprising an intermediate particulate-laden gas chamber between said intermediate housing and said inner housing, an outer particulate housing comprising an outer particulate chamber between said outer housing and said intermediate housing, a particulate-laden gas inlet adapted to receive a particulate-laden gas and in fluid communication with said intermediate chamber, a clean gas outlet in fluid communication with said inner chamber, a particulate outlet in fluid communication with said outer particulate chamber for discharging particulate from said separation device, a plurality of cyclone separator units each generally mounted between said inner housing and said intermediate housing for separating said particulate-laden gas into particulate and cleaned gas and establishing a pressure in said intermediate chamber greater than the pressure within said particulate chamber, the improvement comprising:

passage means between the lower portion of said intermediate particulate-laden gas chamber and said particulate outlet for passing particulate from said intermediate chamber to said particulate outlet;

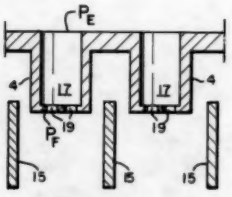
said particulate outlet comprising a particulate flow chamber structurally arranged for receiving a lower portion of said passage means; and

said lower portion of said passage means structurally arranged with respect to said particulater flow chamber to reduce pressure in said particulate flow chamber and thereby prevent gas flow from said lower portion of said passage means into said particulate chamber.

4,398,933
METHOD AND APPARATUS FOR THE MANUFACTURE OF FIBERS

Jacques Lecron, Challes les Eaux; Maxime Manera, Jacob Bellecombette; Jean-Paul Faure, Chignin, and Jean-Pierre Renaudin, Cognin, all of France, assignors to Societe Vetrotex Saint-Gobain, Chambery, France

Continuation-in-part of Ser. No. 207,712, Nov. 17, 1980, abandoned. This application May 3, 1982, Ser. No. 374,272
Int. Cl.³ C03B 37/025
U.S. Cl. 65—1 33 Claims



1. Apparatus for use in the drawing of filaments from attenuable material in attenuable condition, such as molten glass, comprising a bushing having a chamber for the attenuable material in attenuable condition and having a bottom wall with downwardly presented portions at higher and lower levels, characterized in that the lower wall portions comprise the bottom walls of bosses each of which contains plural upwardly open alveoles, the said bosses being spaced in rows, the alveoles each being provided with a plurality of orifices extending through the bottom walls of the bosses for delivery of attenuable material through the alveoles, and mechanism spaced below the bushing for drawing filaments from attenuable material delivered through the alveoles from said chamber, and downwardly open channels between rows of bosses.

4,398,934

MANUFACTURE OF STAPLE GLASS FIBERS

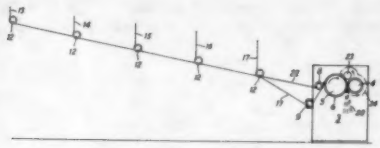
John H. Willis, Anderson, S.C., and Trevor C. Heath, Yately, England, assignors to TBA Industrial Products Ltd., United Kingdom and Bishop and Associates, Inc., Greenville, S.C.

Division of Ser. No. 236,362, Feb. 20, 1981, Pat. No. 4,347,071, which is a continuation of Ser. No. 97,429, Nov. 26, 1979, abandoned. This application Apr. 12, 1982, Ser. No. 367,526

Claims priority, application United Kingdom, Nov. 24, 1978, 45911/78

Int. Cl.³ C03D *37/025*

U.S. Cl. 65—2 4 Claims



1. In the method of manufacture of staple glass fibers by drawing a plurality of glass filaments from a bushing and chopping them directly into staple fibers without intervening winding and storage, the improvement which comprises the steps of initiating said drawing by forming said filaments into a coil on the circumference of an auxiliary roller, forming an initial winding thereon by rotating said roller with a progressively increasing surface speed until the filaments advancing towards said roller attain the normal production speed for said bushing, then diverting said filaments, whilst still travelling at said speed and without breaking them, into driving contact with a cutter back-up roll driven with substantially the same surface speed as said production speed, and advancing said diverted filaments by means of said roll into a cutting zone whereat they are both severed from said initial winding and continuously chopped into staple fibers.

4,398,935

METHOD AND DEVICE FOR THE HIGH-PRECISION MANUFACTURE OF GLASS ARTICLES, IN PARTICULAR LENSES

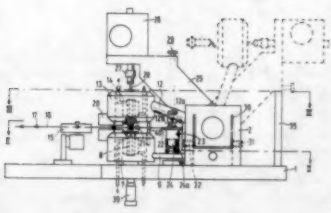
Hendricus F. G. Smulders, and Gerrit E. Bartman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,686

Claims priority, application Netherlands, Oct. 29, 1981, 8104895

Int. Cl.³ C03B *11/16*

U.S. Cl. 65—64 8 Claims



1. A method for high-precision manufacture of glass articles, including optical lenses, comprising;

heating a roughly metered volume of glass in a product holder in a furnace until softening to form a roughly preformed glass product,

moving at least two mould sections and said product holder toward each other at such mutual speeds that said mould sections simultaneously contact said roughly preformed glass product, and

terminating movement of said mould sections toward each other at a given separation from one another.

4,398,936

PROCESS FOR THE PREPARATION OF A GRANULAR NPK FERTILIZER AND GRANULAR NPK FERTILIZERS OBTAINED BY THIS PROCESS

Johan W. Hoogendonk, Geleen, and Servatius J. Lucassen, Schimmert, both of Netherlands, assignors to Unie van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Continuation of Ser. No. 53,851, Jul. 2, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,502

Claims priority, application Netherlands, Jul. 4, 1978, 7807219

Int. Cl.³ C05B *19/00;* C05C *1/02;* C05D *1/02*

U.S. Cl. 71—36 9 Claims

1. In a process for the preparation of granules of NPK fertilizer comprising adding a solid potassium salt to a liquid melt or aqueous solution containing ammonium nitrate and ammonium phosphate and granulating the resulting mixture, the improvement comprising adding said potassium salt to said liquid melt or aqueous solution in the form of particles having a temperature in the range of between 5° C. and 40° C. and an average particle size of at most 55 microns with at most 1 percent by weight of particles over 150 microns, whereupon said resulting mixture is granulated, thereby forming storage-stable granules of NPK fertilizer.

4,398,937

SELECTIVE ALGAECIDES FOR CONTROL OF CYANOCHLORONTA

Robert T. van Aller, and George F. Pessoney, both of Hattiesburg, Miss., assignors to The University of Southern Mississippi, Hattiesburg, Miss.

Filed Oct. 6, 1981, Ser. No. 308,987

Int. Cl.³ A01N *37/02, 37/06*

U.S. Cl. 71—67 10 Claims

1. A method of selectively controlling the growth of blue-green algae and yellow-green algae while maintaining a desirable balance of planktonic organisms in bodies of water in which populations of harmful blue-green algae are reduced in numbers leaving green algae and their oxygen producing capacity and food value substantially unreduced comprising adding from about 0.01 to about 100 ppm of a fatty acid compound selected from the group consisting of 9, 10-dihydroxystearic acid, Dodecanoic acid, Linoleic acid and Ricinoleic acid to the aqueous medium.

4,398,938

N-ACYLATED LACTAMS AND THEIR HERBICIDAL COMPOSITIONS AND METHOD OF USE

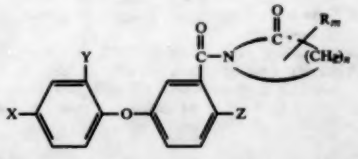
Leonard J. Stach, Riverside, and Frank Wu, Libertyville, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 20, 1982, Ser. No. 379,839

Int. Cl.³ A01N *43/46;* C07D *223/10*

U.S. Cl. 71—88 12 Claims

1. A compound of the formula:



wherein X is halogen or trifluoromethyl; Y is hydrogen, halo-

gen or cyano; Z is halogen, cyano or nitro; R is C_1–C_6 alkyl; m is an integer from 0 to 6 and n is an integer from 3 to 5.

12. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient in a quantity toxic to weeds, a compound of claim 1.

4,398,939

HERBICIDAL THIOPHENESULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 153,279, Jun. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,025, Apr. 4, 1979, abandoned. This application May 4, 1981, Ser. No. 255,226

Int. Cl.³ A01N *9/16;* **C07D** *239/44*

U.S. Cl. 71—90 **41 Claims**

1. A compound of the formula:

wherein

A is $SO_2N(R_3)C(O)N(R_4)R_5$;

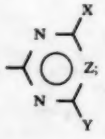
R is C_1–C_4 alkyl, C_3 alkenyl, OCH_3, NO_2, Cl, Br, $SO_2NR_1R_2$ and $SO_2N(OCH_3)CH_3$;

R_1 and R_2 are independently C_1–C_3 alkyl;

R_3 is H or CH_3;

R_4 is H, CH_3 or OCH_3;

R_5 is



X is H, Cl, Br, CH_3, CH_2CH_3, C_1–C_3 alkoxy, CF_3, SCH_3, CH_2OCH_3, $OCH_2CH{=}CH_2$ or $OCH_2C{\equiv}CH$;

Y is CH_3 or OCH_3;

Z is CH, CCl, CBr, CCN, CCH_3, CCH_2CH_3, CCH_2CH_2Cl or $CCH_2CH{=}CH_2$;

Y^1 is H, CH_3, OCH_3 or Cl;

X^2 and Y^2 are independently CH_3 or OCH_3; and

Q is O or CH_2; and their agricultural salts;

provided that

(a) A cannot be in the 4-position of the thiophene ring; and

(b) one of R_3 or R_4 must be H; and

(c) when A is in the 3-position and R is in the 2-position, then R is other than Cl, Br or CH_3.

33. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,398,940

N-AMIDES OF 2-BENZOTHIAZOLINONE

John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

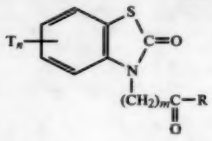
Division of Ser. No. 51,483, Jun. 25, 1979, Pat. No. 4,323,677, which is a continuation of Ser. No. 861,476, Dec. 16, 1977, abandoned. This application Oct. 15, 1981, Ser. No. 311,359

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

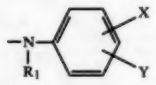
Int. Cl.³ A01N *9/12*

U.S. Cl. 71—90 **17 Claims**

9. A plant growth regulating composition which comprises from about 5 to about 95 parts by weight of a 2-oxo 3-benzothiazolineacetamide having the formula



wherein T is trifluoromethyl and halo, n is 0 or 1; m is an integer from one to four; and R is selected from the group consisting of



(I)

wherein X and Y are independently selected from the group consisting of hydrogen, halogen, lower alkyl and trifluoromethyl; R_1 is hydrogen or lower alkyl; and (II) heterocyclics selected from the group consisting of morpholino, cis- and trans-2,6-dimethylmorpholino, cis- and trans-2,5-dimethylpyrrolidino, 3-azabicyclo (3.2.2) nonyl, and ethyl N-piperazinocarboxylate; the remaining parts being composed of one or more suitable carriers, diluents and/or adjuvants.

4,398,941

HERBICIDAL COMPOSITION AND METHOD

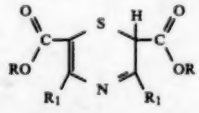
Robert K. Howe, Bridgeton, and Len F. Lee, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 8, 1982, Ser. No. 356,010

Int. Cl.³ C07D *279/12, 295/08, 295/10;* **A01N** *43/84*

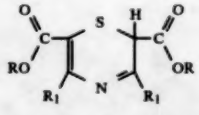
U.S. Cl. 71—90 **49 Claims**

1. A compound represented by the formula



wherein R is selected from the group consisting of H and lower alkyl radicals and R_1 represents a perfluoroalkyl radical having from 1 to 3 carbon atoms.

10. Herbicidal compositions comprising an adjuvant and a herbicidally effective amount of a compound represented by the formula



wherein R is selected from the group consisting of H and lower alkyl radicals and R_1 represents a perfluoroalkyl radical having from 1 to 3 carbon atoms.

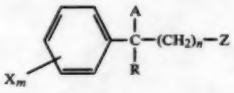
4,398,942

HERBICIDALLY-ACTIVE PHENYLACETONITRILES

Hirotake Ikari, Urawa, and Kanichi Kakizaki, Kazo, both of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 22, 1980, Ser. No. 218,326
Int. Cl.³ A01N *43/54, 43/64, 43/60, 43/40*
U.S. Cl. 71—92 10 Claims

1. A method for selectively controlling preemergence weed plant growth in transplanted rice fields under aquatic conditions which comprises applying to said plants or plant habitat in said rice fields before, at the time of, or after transplanting the rice plants an inhibiting amount of a compound having the formula:



wherein

X is selected from hydrogen, $(C_1–C_4)$alkyl, F, Cl, Br, NO_2 or $SO_2C_6H_5$;

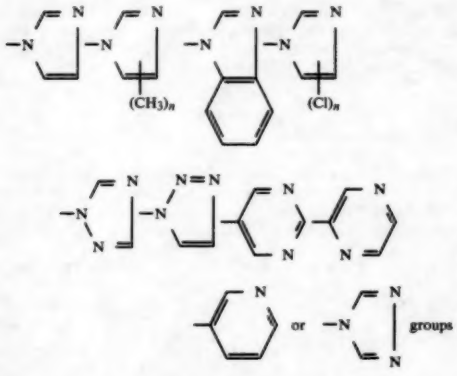
R is selected from C_6H_5, C_6H_4—X wherein X is as defined above, straight or branched chain $(C_1–C_8)$ alkyl, $(C_3–C_6)$ saturated or unsaturated cycloaliphatic groups, $C_6H_5CH_2$— or C_6H_5S—;

n is selected from 0, 1 or 2;

m is selected from 0, 1 or 2;

A is selected from CN and C≡CH; and

Z is a N-heterocyclic group selected from:



or an agronomically acceptable acid addition salt thereof.

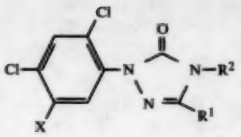
4,398,943

TRIAZOLINONE DERIVATIVE AND HERBICIDAL USE THEREOF

Mitsuru Kajioka, Sakai; Katsumasa Okawa, Kawachinagano, and Kuniaki Taninaka, Neyagawa, all of Japan, assignors to Nikon Nohyaku Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 331,064
Claims priority, application Japan, Dec. 25, 1980, 55-184557; Dec. 25, 1980, 55-184558; Apr. 30, 1981, 56-65497
Int. Cl.³ A01N *43/64;* C07D *249/12*
U.S. Cl. 71—92 38 Claims

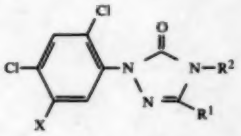
1. A Δ^2-1,2,4-triazoline-5-one derivative represented by the formula (I)



(I)

wherein R^1 is a $C_1–C_4$ alkyl group; R^2 is a $C_3–C_5$ alkynyl group, a halomethyl group, or a haloethyl group; and X is a $C_1–C_4$ alkoxy group, a $C_2–C_6$ alkenyloxy group, a $C_2–C_6$ alkoxyalkoxy group, a $C_3–C_8$ alkynyloxy group, a hydroxy group, a halomethyloxy group, a 3-chloro-2-propenoxy group, a 1-ethynyl-1-cyclohexyloxy group, or a halethyloxy group.

11. A herbicidal composition comprising an effective amount of a Δ^2-1,2,4-triazolin-5-one derivative and a diluent, said derivative being represented by the formula



(I)

wherein R^1 is a $C_1–C_4$ alkyl group; R^2 is a $C_3–C_5$ alkynyl group, a halomethyl group, or a haloethyl group; and X is $C_1–C_4$ alkoxy group, a $C_2–C_6$ alkenyloxy group, a $C_2–C_6$ alkoxyalkoxy group, a $C_3–C_8$ alkynyloxy group, a hydroxy group, a halomethyloxy group, a 3-chloro-2-propenoxy group, a 1-ethynyl-1-cyclohexyloxy group, or a haloethyloxy group.

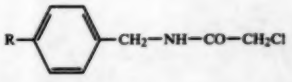
4,398,944

HERBICIDAL COMPOSITION AND METHOD FOR INHIBITING GROWTH OF WEEDS

Katsumichi Aoki; Hideo Arabori; Keigo Satake, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1981, Ser. No. 273,313
Claims priority, application Japan, Jun. 26, 1980, 55-78135
Int. Cl.³ A01N *37/18*
U.S. Cl. 71—118 6 Claims

1. A method for inhibiting growth of weeds comprising applying a herbicidally effective amount of a compound of the formula:



wherein R is a methoxy-, ethoxy-, propoxy-, isopropoxy- or allyloxy to soil to inhibit the growth of weeds.

4,398,945

PROCESS FOR PRODUCING A FERRONICKEL ALLOY FROM NICKEL BEARING LATERITES

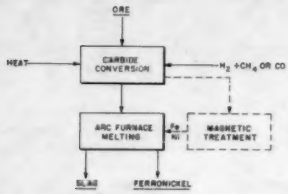
Frank M. Stephens, Jr., 12225 W. 18th Dr., Lakewood, Colo. 80233

Filed Jun. 22, 1981, Ser. No. 276,040
Int. Cl.³ C21C *5/52*
U.S. Cl. 75—11 6 Claims

1. A process for recovering a metal which has a melting point in excess of about 750° C, and is capable of alloying with iron, in the form of an iron alloy from a material containing iron and said metal, said process comprising:

(a) contacting said material with iron carbide, at least some of said iron carbide being formed by converting at least

some of said iron in the material containing iron to iron carbide in a fluidized bed in the presence of a carbon-supplying material and a reducing agent, and



(b) smelting the product of step (a) to produce the alloy of said metal with iron

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4,398,946

METHOD OF HOMOGENIZING CAST IRON MELTS AND COMPACTS FOR THE CARRYING OUT THEREOF

Heinz-Ulrich Doliwa, Friedberg, Fed. Rep. of Germany, assignor to Werner Kessl Giessereibedarf GmbH, Bärnwinkel, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,536

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033194

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—30 **4 Claims**

1. A method of producing homogeneous cast-iron melts from a heterogeneous charge containing steel scrap, comprising the step of adding to the melt a compact comprising a component selected from (1) silicon carbide, (2) ferrosilicon, calcium silicon, ferrochromium, ferromanganese, ferrophosphorus, iron chips, or steel chips, and (3) a slag-forming admixture from the ternary system 8–18% CaO—10–40% SiO_2—2–16% Al_2O_3, which compact also contains a hydrocarbon or hydrocarbon-nitrogen compound selected from naphthalene, anthracene, pyrene, carbazol, phenylnaphthylcarbazol, and anthraquinone in an amount of 0.5 to 40% per compact.

4,398,947

COATED MAGNESIUM GRANULES HAVING ANTI-CAKING PROPERTIES

Ramaswami Neelameggham, Salt Lake City, Utah, and John C. Priscu, Las Vegas, Nev., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 23, 1982, Ser. No. 421,890

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—53 **5 Claims**

1. As an article of manufacture, an addition agent in the form of free flowing magnesium granules characterized by a surface coating of at least one anti-caking agent selected from the group consisting of stearates of magnesium, calcium and aluminum.

4,398,948

METHODS FOR CONTROLLING BLOWING, CONTROLLING THE SLAG FORMATION AND PREDICTING SLOPPING IN THE BLOWING OF MOLTEN PIG IRON IN LD CONVERTER

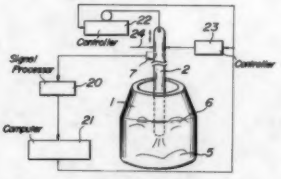
Kanji Emoto; Masayuki Onishi; Hirosuke Yamada; Katsuhisa Hirayama; Hideshi Ohzu; Masakatsu Ogawa, and Yasuo Masuda, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 100,187, Dec. 4, 1979, abandoned. This application May 28, 1981, Ser. No. 268,061

Claims priority, application Japan, Dec. 5, 1978, 53-150261; Dec. 5, 1978, 53-150262; Dec. 29, 1978, 53-162196; Mar. 20, 1979, 54-33033; Jun. 7, 1979, 54-70633

Int. Cl.³ C21C *5/30*

U.S. Cl. 75—60 **12 Claims**



1. A method for controlling a slag formation in an LD converter, which comprises steps of providing a member vertically hung in the converter to be subjected to slag movements caused by foamed slag, providing an acceleration detector secured to the member for measuring acceleration of horizontal movement acting on the member, integrating the values of said measured acceleration to obtain the average values of said integrated acceleration over every several seconds, and changing at least one of the member's height and oxygen flow rate in the converter using the integrated average values of acceleration so as to control the slag formation in the converter.

4,398,949

METHOD FOR STABLY REFINING HIGH CARBON STEEL

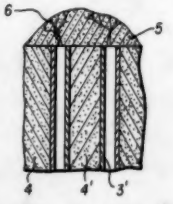
Minoru Kitamura, Nishinomiya; Shinji Koyama; Shuzo Ito, both of Kobe; Masahiko Ohgami, Kakogawa, and Hideaki Fujimoto, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 28, 1981, Ser. No. 315,888

Claims priority, application Japan, Dec. 18, 1980, 55-179887

Int. Cl.³ C21C *5/34*

U.S. Cl. 75—60 **5 Claims**



1. A method for stably refining high carbon steel by top and bottom blown converter refining utilizing a converter, a top blowing lance nozzle and a nozzle at the bottom of the converter, which comprises:

blowing refining pure oxygen onto molten iron through said top blowing lance nozzle;

simultaneously blowing an inert gas into the converter through said nozzle at the bottom thereof wherein said blowing of inert gas further comprises feeding the bottom

blown inert gas at a rate less than 0.09 Nm^3/min-ton during blowing of said inert gas; and

subsequently feeding the bottom blown inert gas at a rate less than 0.03 Nm^3/min-ton during a controlling stage subsequent to the blowing of said inert gas.

4,398,950

HIGH STRENGTH COLD ROLLED, WELDABLE STEEL STRIP

Indra Gupta, Munster; Raymond V. Fostini, Crown Point, and Timothy E. Moss, Highland, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jul. 10, 1979, Ser. No. 56,329
Int. Cl.³ F16H *29/10*
U.S. Cl. 75—124 **9 Claims**

1. A strong, ductile, cold rolled steel strip having good resistance spot weldability, said strip comprising:

a composition consisting essentially of, in wt.%:

carbon	.04–.10
manganese	.3–.7
silicon	0.01–0.30
aluminum	0.03–0.12
sulfur	.03 max.
phosphorus	greater than .04 up to .15
titanium	.04–.14
iron	essentially the balance;

and a yield strength in the range of about 40,000–60,000 psi (276–414 MPa).

8. A method for improving the resistance spot weldability of a cold rolled steel strip having a composition consisting essentially of, in wt.%:

carbon	.04–.10
manganese	.3–.7
silicon	0.01–0.30
aluminum	0.03–0.12
sulfur	.03 max.
iron	essentially the balance,

while providing said cold rolled steel strip with a yield strength in the range 40,000–60,000 psi (276–414 MPa), said method comprising the step of:

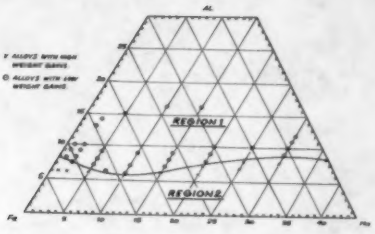
including, in the composition of said cold rolled steel strip, 0.04–0.14 wt.% titanium and greater than 0.04 up to 0.15 wt. % phosphorous.

4,398,951

FERMALLOY(FE-MN-AL STAINLESS STEEL)

Greig R. Wallwork, Sydney, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Apr. 12, 1982, Ser. No. 367,800
Claims priority, application Australia, Apr. 22, 1981, PE8543
Int. Cl.³ C22C *39/02, 37/10*
U.S. Cl. 75—124 E **9 Claims**



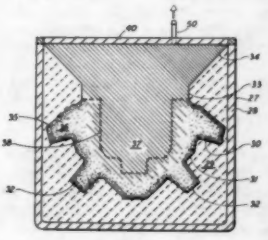
1. A substantially ferritic alloy consisting essentially of
aluminium—4 to 9%,
manganese—3 to 15%,
chromium—0 to 6%, and
iron—balance to 100%.

4,398,952

METHODS OF MANUFACTURING GRADIENT COMPOSITE METALLIC STRUCTURES

Eric F. Drake, Pearland, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Sep. 10, 1980, Ser. No. 185,696
Int. Cl.³ B22F *3/14, 5/08, 7/02*
U.S. Cl. 419—18 **18 Claims**



11. The method of claim 7, 8 or 9 wherein said refractory compound comprises tungsten carbide, and said binder metal or alloy comprises a metal selected from the group of iron, nickel cobalt, and copper.

4,398,953

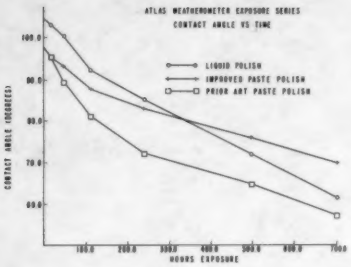
CAR WAXES WITH IMPROVED WATER-BEADING DURABILITY

Willem B. van der Linde, Cherry Hill, N.J., assignor to Borden, Inc., Columbus, Ohio

Filed Oct. 26, 1981, Ser. No. 314,971
Int. Cl.³ C08H *9/08*
U.S. Cl. 106—10 **7 Claims**

1. An improved silicone-containing, oil-in-water emulsion, paste polish composition of the kind composed of montan wax, an emulsifier, silicone oil, amino silicones, finely-divided abrasive, water, a volatile aliphatic hydrocarbon liquid, and optionally, pigment, wherein the improvement comprises utilizing in said composition about 10 to 25% by weight, based on the

weight of the composition, of water and about 30 to 75% by weight, based on the weight of the composition, of a volatile aliphatic hydrocarbon liquid where at least 60% by weight of



said volatile hydrocarbon liquid is a volatile hydrocarbon having an evaporation rate three to five times faster than that of water.

4,398,954

MICROCAPSULAR COATING COMPOSITION CONTAINING A HYDROPHOBIC SILICA

John J. Stolfo, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 108,909, Dec. 31, 1979, Pat. No. 4,268,069. This application Oct. 10, 1980, Ser. No. 195,910

Int. Cl.³ C09D *11/00*; **B01J** *13/02*

U.S. Cl. 106—21 **10 Claims**

7. A coating composition having utility in the manufacture of coated paper, wherein said coating composition contains microcapsules, said paper being characterized by a substantial reduction of specking when used in photocopying apparatus which utilizes a pressure nip between a photoreceptor belt and a transfer roll to transfer a powder image from the photoreceptor belt to the paper, said coating composition comprising microcapsules containing an oil, said oil containing in solution therein a chromogenic material, said chromogenic material being a color precursor of the electron donating type, said microcapsules being dispersed in an aqueous continuous phase said microcapsules having a mean spherical diameter of from 3 to 12 microns, said aqueous continuous phase further containing an amount of surfactant up to about 0.6% solids by weight based on the total solids and finely divided silica particles, stilt material and a binder for said microcapsules, said stilt material and said silica particles, said silica particles having been modified by treatment with an organic material whereby the surface of said silica is substantially hydrophobic said treated silica particles having a surface area of 50 m^2/gm or more and being present in said coating composition at a level of from 0.1% to 10.0% by weight based on the total solids of said coating composition.

4,398,955

DISPERSIONS

James F. Stansfield; James Toole, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 180,810, Aug. 25, 1980, abandoned, which is a continuation of Ser. No. 877,390, Feb. 13, 1978, Pat. No. 4,213,028. This application Jun. 23, 1981, Ser. No. 276,516

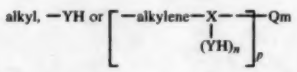
Claims priority, application United Kingdom, Feb. 21, 1977, 7185/77

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—23 **10 Claims**

1. A process for the preparation of a dispersion of an inorganic pigment in a polar organic medium, said process consisting essentially of grinding the pigment in the polar organic medium in the presence of a dispersing agent, in which the dispersing agent is a tertiary amine of the formula:

wherein each of A, B and D independently represents



wherein each X independently represents an oxygen or a nitrogen atom provided that, where X is oxygen m+n=1 and p=1 and where X is nitrogen m+n=2 and p is from 1 to 30; each Q independently represents alkyl or —YH; and each Y independently represents a poly(lower alkylene oxy) chain containing from 3 to 50 lower alkylene oxy groups provided that, (i) at least one of A, B and D contains a poly(lower alkylene oxy) chain, (ii) at least 50% of the lower alkylene groups in each poly(lower alkylene oxy) chain is propylene and (iii) not more than one of the alkylene or alkyl groups contains more than 8 carbon atoms; or the salt of said amine with a mineral acid or with an aromatic carboxylic or sulphonic acid.

4,398,956

PROCESS FOR TREATING MOIST COMPOSITIONS CONTAINING POLLUTION-CAUSING SUBSTANCES

Carel W. J. Hooykaas, BT Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Rotterdam, Netherlands

Filed Dec. 18, 1981, Ser. No. 332,278

Claims priority, application Netherlands, Dec. 18, 1980, 8006884

Int. Cl.³ C04B *31/10*

U.S. Cl. 106—85 **10 Claims**

1. Process for treating a composition containing a moist metal or metal compounds comprising pollutioncausing compounds easily lixiviatable from said composition, comprising the steps of

(a) mixing said composition with fly ash in such a quantity that small sphere-like particles are formed; and then

(b) mixing said sphere-like particles in the presence of a further amount of said fly ash without crushing said particles.

4,398,957

MORTAR LATEX MIX

Gary W. Ceska, Paoli, Pa., and Gerald W. Burkhart, Parkersburg, W. Va., assignors to Polysar International S.A., Fribourg, Switzerland

Continuation of Ser. No. 234,437, Feb. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 108,769, Dec. 31, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,117

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **5 Claims**

1. A process of producing a concrete paving which comprises:

(a) preparing a cement mortar composition of Portland cement, aggregate, water, from about 1 to about 15 parts by weight on a dry weight basis per 100 parts of cement of a latex of a polymer comprising from about 40 to 70 parts by weight of styrene, from about 60 to 30 parts by weight of butadiene, from about 0.5 to about 5.0 parts of N-methylolacrylamide by weight of said polymer, or from about 0.5 to about 5.0 parts by weight each of N-methylolacrylamide and acrylonitrile by weight of said polymer, said parts in total of N-methylolacrylamide and acrylonitrile being from about 1.0 to about 6.0 parts by

weight of said polymer, and a dispersing agent being a polymerized or condensed alkyl substituted or unsubstituted naphthalene sulfonic acid or salt thereof in an amount of from about 0.5 to about 8 weight percent of the polymer content of said latex; which composition provides increased compressive and flexural strength when cured and permits a reduction in the water content thereof while providing a plastic flowable mix;

(b) applying the mixed composition as a layer to a pavement sub-base; and

(c) curing the pavement.

4,398,958

MAKING LIGHTWEIGHT CONCRETE

Ralph Hodson, Scunthorpe; Kenneth J. Davies, Romsey; Glen J. L. Brown; William L. Carroll, both of Southampton, and Robert Noble, Romsey, all of England, assignors to Cempol Sales Limited, Southampton, England

Filed Feb. 8, 1982, Ser. No. 346,670

Claims priority, application United Kingdom, Mar. 24, 1981, 8109185

Int. Cl.³ C04B *31/44*

U.S. Cl. 106—90 **18 Claims**

1. A method of making lightweight concrete comprising the steps of coating expanded polystyrene beads with an aqueous surfactant solution containing both a substantive cationic surfactant and a non-ionic surfactant, coating the wet beads with dry cement, and then mixing the cement-coated beads with a further supply of cement, water and sand or aggregate to complete the concrete mix.

4,398,959

MORTAR TOPPING WITH CALCIUM NITRITE

Arnold M. Rosenberg, Potomac; James M. Gaidis, Ellicott City, and Howard J. Troffkin, Potomac, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 254,236, Apr. 15, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,292

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **10 Claims**

1. A method of inhibiting corrosion of concrete structure containing metal reinforcement elements therein comprising

removing a layer of concrete from said concrete structure and

refilling the removed area of concrete structure with a cement based composition consisting essentially of, in parts by weight, about 5 to 20 parts hydraulic cement, about 10 to 40 parts sand, about 2 to 10 parts water, about 0 to 1 part lime, about 0 to 50 parts aggregate of up to about 0.5 inch diameter, about 0 to 10 parts latex and about 0.5 to 4 parts calcium nitrite, the calcium nitrite being in at least 20 percent by weight of the water content.

4,398,960

CONCRETE MIXES

John A. Murray, Norristown, Pa., assignor to Conger/Murray Systems, Inc., Palm Beach, Fla.

Filed Jan. 4, 1982, Ser. No. 337,062

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—97 **12 Claims**

1. A concrete mix for forming concrete products curable with carbon dioxide gas which comprises solids in the amount of:

(a) 5–25% by weight of a calcareous cementitious binder;

(b) 50–70% by weight of a coarse aggregate having a particle size in a range of about ¼" to larger than 30 mesh, and

(c) 25–35% by weight of a fine aggregate having a particle size in a range of about 100-pan mesh, and

water, said mix being substantially free of aggregate having a particle size in the range of 30 to 50 mesh.

4,398,961

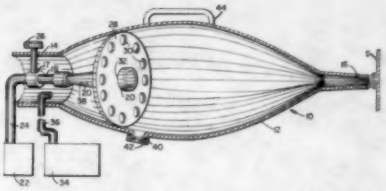
METHOD FOR REMOVING PAINT WITH AIR STREAM HEATED BY HOT GAS

Richard R. Mason, 611 S. Hansell St., Thomasville, Ga. 31792

Filed Dec. 1, 1980, Ser. No. 211,701

Int. Cl.³ B08B *5/00*

U.S. Cl. 134—19 **5 Claims**



1. The method of removing old paint from a surface comprising, providing a housing having an air heating chamber, a nozzle having a cross-sectional area less than that of the air heating chamber, and a burner including a mixing chamber, feeding pressurized air to the housing, surrounding the burner with the pressurized air while bleeding a small portion of the air into the burner mixing chamber and directing the remaining air into the air heating chamber, mixing the air in the mixing chamber with a fuel to provide a combustible fuel mixture, burning the fuel mixture to form a hot gas, transferring heat from the hot gas to the air in the air heating chamber to heat the air, directing the heated air from the heat chamber into the nozzle for increasing the velocity of the air in the nozzle relatively to the velocity of the air in the air heating chamber and for exhausting the hot air from the nozzle as a high velocity concentrated stream, exhausting the hot gas from the housing, and directing both the hot air stream and the hot gas onto the painted surface to remove the old paint without damaging the surface.

5. In the method as recited in claim 1, wherein the temperature of the air stream is in the range of approximately 400° to 500° F.

4,398,962

METHOD OF CONTROLLING BASE CONTACT REGIONS BY FORMING A BLOCKING LAYER CONTIGUOUS TO A DOPED POLY-SI EMITTER SOURCE

Mamoru Kanazawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1981, Ser. No. 306,223

Claims priority, application Japan, Sep. 26, 1980, 55-132850

Int. Cl.³ H01L *21/263, 21/225, 21/20*

U.S. Cl. 148—1.5 **14 Claims**

1. A method of manufacturing a semiconductor device comprising the steps in the following order of:

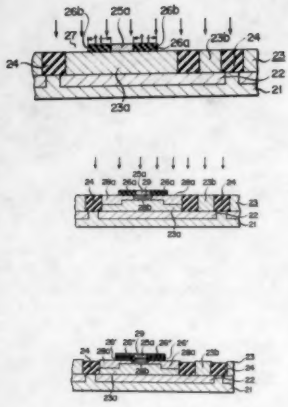
(a) forming a film doped with an emitter impurity on a predetermined surface area of a semiconductor layer which surface area constitutes an island region isolated by an insulating layer;

(b) forming an ion implantation blocking layer covering said doped film and the exposed surface of said semiconductor layer;

(c) anisotropically etching said blocking layer until the surface of said doped film is substantially exposed, by irradiating said blocking layer with a dry etchant in a direction substantially normal to said semiconductor layer, thereby allowing a portion of said blocking layer to remain surrounding said doped film and substantially forming a base contact hole defined between the exposed side surfaces of said remaining blocking layer and said insulating layer;

(d) conducting ion implantation with respect to said semiconductor layer, with said remaining blocking layer and said doped film used as a mask, to form at least a base

contact region of a high impurity concentration in a portion of said semiconductor layer corresponding to said base contact hole; and



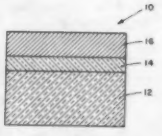
(e) forming an emitter region in said semiconductor layer by diffusing the impurity from said doped film into said semiconductor layer by a thermal treatment.

4,398,963

METHOD FOR MAKING NON-ALLOYED HETEROJUNCTION OHMIC CONTACTS

Richard A. Stall, Summit, N.J.; Colin E. C. Wood, Freeville, and Lester F. Eastman, Ithaca, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1980, Ser. No. 208,596
Int. Cl.³ H01L *21/265, 29/261, 23/48, 7/54*
U.S. Cl. 148—1.5 **5 Claims**



1. A method of making a non-alloyed low resistance phmic contact having specific contact resistance less than 10^{-7} ohm-cm^2 and including a substrate of a semiconductor, a degenerately doped single crystal layer of a material having matching lattice structure to that of said semiconductor and a metallic layer which includes the steps of:

growing the substrate of said semiconductor;

depositing a single crystal layer of degenerately doped material having a doping density exceeding 10^{20} cm^{-3} over the substrate of said semiconductor; and

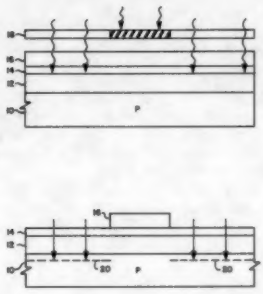
evaporating the metallic layer over the single crystal layer of said degenerately doped material.

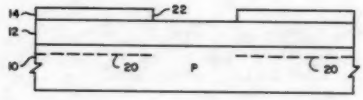
4,398,964

METHOD OF FORMING ION IMPLANTS SELF-ALIGNED WITH A CUT

Manohar L. Malwah, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 10, 1981, Ser. No. 329,364
Int. Cl.³ H01L *21/265, 21/26;* **B05D** *3/06*
U.S. Cl. 148—1.5 **11 Claims**





1. A method of implanting impurity ions in regions lying laterally spaced apart within a first stratum of a semiconductor body and offset and self-aligned with the edges of an opening formed within a second stratum of material lying above said first stratum, said method comprising:

(a) providing a semiconductor body having a first stratum therein and providing a second stratum of material adjacent to said first stratum,

(b) superimposing successive layers of a thin negative photoresist and a thicker positive photoresist over said second stratum in that order,

(c) removing only selected spaced portions of said positive photoresist layer by photolithographic means to produce voids therein,

(d) subjecting the structure thus formed to impurity ions of such velocity that impurity ions deposit in laterally spaced implanted regions of said first stratum that are aligned with said voids but are blocked from regions underlying said positive photoresist layer,

(e) removing the remaining positive photoresist layer and the underlying part of negative photoresist layer, and

(f) while using the remaining negative photoresist layer as a mask, removing material of said second stratum that is uncovered by said negative photoresist layer to produce an opening within said second stratum that is self-aligned with and disposed between said laterally spaced regions of implanted impurity ions.

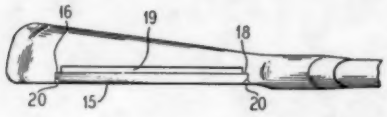
4,398,965
METHOD OF MAKING IRON GOLF CLUBS WITH FLEXIBLE IMPACT SURFACE

Daniel N. Campau, Grand Rapids, Mich., assignor to Pepsico, Inc., Purchase, N.Y.

Continuation-in-part of Ser. No. 735,900, Oct. 26, 1976, which is a continuation-in-part of Ser. No. 659,939, Feb. 20, 1976, Pat. No. 3,989,248, which is a continuation-in-part of Ser. No. 536,431, Dec. 26, 1974, abandoned. This application Aug. 14, 1978, Ser. No. 933,441

Int. Cl.³ C21D *6/02*

U.S. Cl. 148—3 **4 Claims**



1. In a method of investment casting a head of a golf club iron, the steps of:

(a) casting the club head with corrosion resistant stainless steel to provide a club head having upper and lower edges, a heel portion, a toe portion, a front striking face extending between the upper and lower edges, and a slot behind the front striking face extending from the upper edge to the lower edge to provide a flexible and resilient striking plate which is separated from the remainder of the body at the upper and lower edges thereof but which is joined to the remainder of the body in the heel and toe portions;

(b) making the thickness of the striking plate such that when the material of the plate has a tensile strength of about 150,000 psi:

(i) the center of the plate is elastically deflected about 1/64 inch by the impact force exerted on the center of the plate by a golf ball when the club head is swung at the maximum speed that can be expected during normal play;

(ii) the maximum stress within the plate when the plate strikes a golf ball at the maximum speed that can be expected during normal play is less than the tensile strength of the material of the plate; and

(iii) the frequency of vibration of the plate is between about 2500 cycles per second and about 4000 cycles per second;

(c) annealing and hardening the club head after it is cast to increase its tensile strength to at least about 150,000 psi.

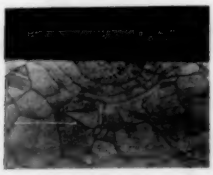
4,398,966
CORROSION OF TYPE 304 STAINLESS STEEL BY LASER SURFACE TREATMENT

Thomas J. Kelly, Suffern, and Joseph L. Nelson, Warwick, both of N.Y., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Apr. 28, 1982, Ser. No. 372,648

Int. Cl.³ C21D *6/00*

U.S. Cl. 148—4 **10 Claims**



1. A process for enhancing the corrosion resistance of stainless steel comprising directing a pulsed energy beam onto a localized portion of a metal surface of stainless steel to rapidly heat the metal to at least the solid solution temperature and then chilling the thus heated metal to result in a quench rate of at least 1×10^3 °C. per second whereby the thus treated localized portion of the surface exhibits enhanced resistance to corrosion.

4,398,967
METHOD FOR INHIBITING ALKALI METAL CORROSION OF NICKEL-CONTAINING ALLOYS

Jackson H. DeVan, Oak Ridge, Tenn., and James E. Selle, assignor to The United States as represented by the U.S. Department of Energy. Washington, D.C. Westminster, Colo.

Continuation-in-part of Ser. No. 74,288, Sep. 11, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,195

Int. Cl.³ C23F *7/00*

U.S. Cl. 148—6.11 **13 Claims**

1. In a closed apparatus consisting essentially of nickel-containing alloy components exposed to a molten alkali metal corrosive environment, the method of inhibiting corrosion by said molten alkali metal comprising dissolving in said molten alkali metal a metal selected from the group consisting of aluminum, silicon, and manganese in an amount sufficient to cause the formation of a corrosion-resistant coating on said exposed alloy components.

4,398,968
METHOD OF BORONIZING TRANSITION METAL SURFACES

Koichiro Koyama, Hyogo, Japan, and Hiroshi Shimotake, Hinsdale, Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,310

Int. Cl.³ B05D *5/12*

U.S. Cl. 148—6.11 **10 Claims**

1. A method of preparing a corrosion resistant coating on a transition metal substrate comprising:

preparing a melt including an alkali metal boron tetrafluoride salt;

dispersing and at least partially dissolving a particulate transition metal boride in said melt; and

immersing said transition metal in said melt, while said melt is at a temperature of no more than 700° C., to form a surface layer on said transition metal containing a transition metal boride.

4,398,969

SHAPE-MEMORY ALLOY BASED ON COPPER, ZINC AND ALUMINUM AND PROCESS FOR PREPARING IT

Keith Melton, Busslingen; Olivier Mercier, Ennetbaden, and Helmut Riegger, Busslingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

PCT No. PCT/CH81/00024, § 371 Date Nov. 3, 1981, § 102(e) Date Nov. 3, 1981, PCT Pub. No. WO81/02587, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 2, 1981, Ser. No. 320,966

Claims priority, application Switzerland, Mar. 3, 1980, 80200186

Int. Cl.³ C22C *9/01, 9/04*

U.S. Cl. 148—11.5 C 12 Claims

1. A shape-memory alloy based on copper, zinc and aluminum, which is present in the beta-phase, characterized in that it is prepared by powder metallurgical techniques from pre-alloys and pre-mixtures, that it has a fine-grained structure with a grain size of at most 100 micrometers and that at least one metal oxide is present in an amount of 0.5 to 2% by weight of the entire mass of the alloy as a dispersoid in the matrix formed by the beta phase.

4,398,970

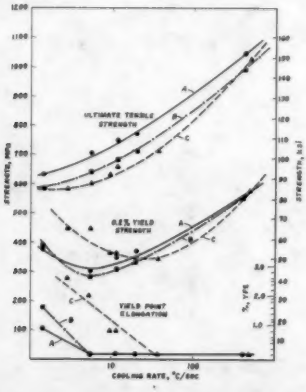
TITANIUM AND VANADIUM DUAL-PHASE STEEL AND METHOD OF MANUFACTURE

Arnold R. Marder, and Bruce L. Bramfitt, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 5, 1981, Ser. No. 308,686

Int. Cl.³ C21D *8/00;* C22C *38/12*

U.S. Cl. 148—12 F 6 Claims



1. A high-strength dual-phase steel consisting essentially of, by weight 0.07–0.12% carbon, 0.50–1.60% manganese, 0.30–0.70% silicon, up to 0.020% phosphorus, up to 0.020% sulfur, up to 0.008% nitrogen 0.02–0.06% aluminum, 0.03–0.15% vanadium, 0.02–0.11% titanium, provided that the atomic percent of titanium is between 1 and 1.6 times the atomic percent of sulfur plus nitrogen, balance iron, said steel being characterized by a YS/TS ratio ≦0.6.

4,398,971

METHOD OF HEATING, HOLDING OR HEAT TREATMENT OF METAL MATERIAL

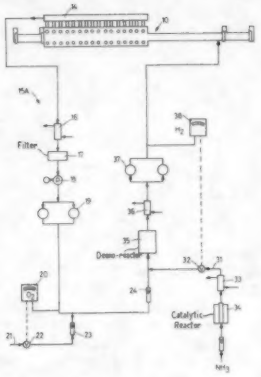
Rune Peterson, Västeros, Sweden, assignor to Aga Aktiebolag, Lidingoö, Sweden

PCT No. PCT/SE81/00134, § 371 Date Dec. 31, 1981, § 102(e) Date Dec. 31, 1981, PCT Pub. No. WO81/03184, PCT Pub. Date Nov. 12, 1981

PCT Filed May 5, 1981, Ser. No. 337,087

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16 8 Claims



1. Method of heating, holding or heat treatment of metal material in an atmosphere of processing gas consisting predominantly of nitrogen and produced at, or in close vicinity to, the location where the heating, holding or heat treatment takes place, characterized in that the processing gas is produced using as the principal raw material exhaust gases from an installation generating heat by the complete combustion of hydrocarbon fuel, the exhaust gases being substantially free of carbon dioxide and water vapor and having a predetermined oxygen content of one or a few percent by volume, and hydrogen being then added in an amount having a predetermined relationship to the oxygen content.

4,398,972

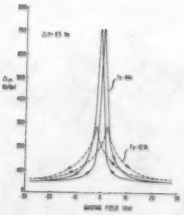
FERRITIC FE-NI MAGNETIC ALLOYS

Chester M. Bordelon, Shreveport, La.; Gilbert Y. Chin, Berkeley Heights, N.J.; Sungho Jin, Meyersville, N.J.; Richard C. Sherwood, New Providence, N.J., and Jack H. Wernick, Madison, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1981, Ser. No. 262,602

Int. Cl.³ C04B *35/00*

U.S. Cl. 148—31.55 26 Claims



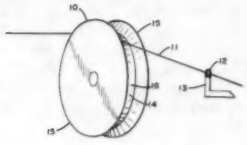
1. Device comprising a body of a magnetically soft Fe-Ni alloy, characterized in that the alloy has

(a) a Ni content in the range of about 4 to a value less than about 16 weight percent and a multiphase structure and
(b) a maximum permeability μ_m at least as large as the value given by the expression $1.5[25(16-x)^2]G/Oe$, where "x" is equal to the weight percent of Ni.

4,398,973
TRAVERSE ANNEALER

O. Leon Thomas, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Oct. 26, 1981, Ser. No. 314,905
Int. Cl.³ C21D *9/52, 9/62;*
U.S. Cl. 148—154 **18 Claims**

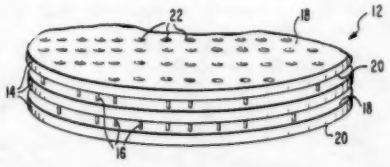


1. In a system for annealing strand at high speed of the type comprising at least two sheaves across which said strand passes and becomes electrically annealed, the improvement comprising.
(a) a first flange member;
(b) a second flange member concentric with said first flange member and adjacent thereto;
(c) a hardened annealing band positioned between said first and second flange members and forming the bottom of a sheave groove; and
(d) means for guiding said strand along a predetermined traverse zone on the surface of said band.

4,398,974
TEMPERATURE GRADIENT ZONE MELTING PROCESS EMPLOYING A BUFFER LAYER

Kuen Chow, Thousand Oaks, and Jan Grinberg, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 9, 1982, Ser. No. 366,900
Int. Cl.³ H01L *21/228*
U.S. Cl. 148—171 **6 Claims**



1. In the process for fabricating a semiconductor device by thermal gradient zone melting wherein said process comprises the steps of:
selecting a wafer body of suitable semiconductor material which is of one type of conductivity, said body having two major generally parallel opposed surfaces, said opposed surfaces being respectively the top and bottom surfaces;
depositing an array of droplets in solid form on said top surface, said droplets comprising suitable metal-rich conductive material which is of an opposite type of conductivity;
heating said wafer body and said droplets to a sufficient temperature for simultaneously
(a) establishing a thermal gradient through said wafer body wherein said bottom surface is at a higher temperature than said top surface, and
(b) melting said droplets to enable migration of said droplets through said wafer body toward said bottom surface; and
removing heat from said top surface to enhance the establishment of said thermal gradient, whereby said droplets form column-like paths the conductivity of which is opposite to the conductivity of said wafer body, the improvement which comprises:
applying a layer of suitable buffer material on the entire area of said bottom surface, said buffer layer having the characteristic of being insoluble with said droplets; and
placing said wafer body on a generally planar surface of heating means with the entire area of said bottom surface having said buffer layer thereon directly on said heating surface,
whereby said buffer layer terminates said migration of said droplets to prevent alloying of said droplets with said heating surface.

4,398,975
CONDUCTIVE PASTE

Kenji Ohsawa, Yokohama; Takao Ito; Koichiro Tanno, both of Tokyo; Masayuki Ohsawa, and Keiji Kurata, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,229
Claims priority, application Japan, Dec. 25, 1980, 55-184773
Int. Cl.³ C22C *28/00*
U.S. Cl. 148—400 **10 Claims**

1. A conductive paste comprising:
a continuous phase of metallic gallium in combination with a first metal which forms a eutectic with gallium, said metal being present in excess of its solubility limit in gallium at a predetermined temperature,
in combination with a second metal powder capable of alloying with gallium, said powder being pre-coated with said first metal and being dispersed through said continuous phase.

9. A method for making a conductive composition which comprises:
providing a molten mixture of gallium and a first metal which forms a eutectic with gallium at a temperature in excess of the melting point of said metal,
cooling the resulting melt to a lower temperature,
adding to the cooled melt a powder having a central core of a second metal or alloy capable of alloying with gallium to form a gallium alloy of a higher melting point than the gallium itself, said core being pre-coated with said first metal, and
agitating the resulting mixture to disperse said powder within said melt.

4,398,976
WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Katsuhide Hattori; Yoshiaki Fukatsu, and Akio Torii, all of Chita, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,896
Claims priority, application Japan, Jan. 12, 1981, 56-2771
Int. Cl.³ C06B *45/02*
U.S. Cl. 149—21 **4 Claims**

1. A water-in-oil emulsion explosive composition comprising (a) a disperse phase formed of an aqueous solution of inorganic nitrate consisting mainly of ammonium nitrate, (b) a continuous phase formed of an oil, (c) an emulsifier, (d) hollow microspheres and/or a chemical foaming agent, and (e) 2–15% by weight of an inorganic chlorate sensitizer.

4,398,977

SIMULTANEOUS RED SMOKE AND BRIGHT FLAME COMPOSITION CONTAINING AMMONIUM IODATE

Henry A. Webster, III, Ellettsville, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1982, Ser. No. 405,648
Int. Cl.³ C06B 33/06
U.S. Cl. 149—42 8 Claims

1. A pyrotechnic composition for simultaneously producing red smoke and bright flame comprised, by weight, of
between 25 and 65 percent of ammonium iodate,
between 30 and 45 percent of iodoform,
between 0 and 5 percent of diatomaceous earth, and the balance of a fuel selected from a group consisting of bismuth, molybdenum, and a mixture of bismuth and magnesium.

4,398,978

HIGH DENSITY, LOW VISCOSITY AIRBREATHER FUEL (RJ-4-I)

George W. Burdette, Ridgecrest, Calif., and Abraham I. Schneider, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1982, Ser. No. 371,869
Int. Cl.³ D03D 23/00, 43/00
U.S. Cl. 149—109.6 7 Claims

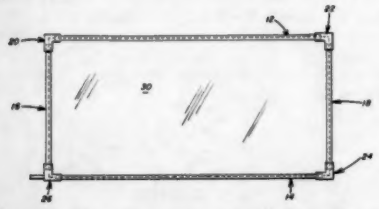
1. A process for making a high density, low viscosity liquid airbreather fuel, isomerized RJ-4, comprising the steps of:
(a) contacting RJ-4, comprising both endo-tetrahydrodimethylidicylopentadiene and exo-tetrahydrodimethyldicyclopentadiene isomers, with a catalyst consisting essentially of an $AlCl_3$-olefin complex; and
(b) treating for a sufficient time to obtain isomerized RJ-4 consisting essentially of the exo-tetrahydrodimethyldicyclopentadiene isomer.

4,398,979

VACUUM CHANNEL METHOD OF LAMINATING GLASS SHEETS

William P. Cathers, Allison Park, and John S. Ferretti, North Huntingdon, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 22, 1982, Ser. No. 350,892
Int. Cl.³ B32B 31/00
U.S. Cl. 156—87 5 Claims



1. A method of laminating one or more glass sheets of substantially identical polygonal outline to a flexible plastic sheet of substantially similar polygonal outline to form a polygonal laminated assembly having straight sides and sharply bent corners comprising mounting said sheets in aligned relation to form an assembly of polygonal configuration, applying to each straight side of said assembly at least one straight, flexible, channel-shaped member having flexible lips extending from the base of said channel-shaped member and a length shorter than the corresponding straight side of said assembly in such a manner that said flexible lips engage the edge portions of the outer major surfaces of said assembly along a substantial portion of the lengths of said corresponding straight sides and said bases of said straight channel-shaped members are in spaced relation to said corresponding straight sides to form straight passages between said bases and said straight sides enclosed by said flexible lips, said passages terminating short of said sharply bent corners, applying a sharply angled channel-shaped member having flexible lips of different length than those of said straight, flexible, channel-shaped members and a base of different width than said bases of said straight, flexible channel-shaped members to each of said sharp corners in such a manner that said flexible lips of said sharply angled channel-shaped members engage the edge portions of the outer major surfaces of said assembly at each of said sharply bent corners and also extend from said sharply bent corners sufficient distance to be in overlapping relation with the flexible lips at the end portions of adjacent of said straight, flexible, channel-shaped members to cooperate with said straight, flexible, channel-shaped members to form a continuous chamber around said polygonal assembly, and connecting at least one of said channel-shaped members to a source of vacuum to remove entrapped fluid from any interfacial surface between said sheets through said continuous chamber.

4,398,980

METHOD FOR FABRICATING A SEAL BETWEEN A CERAMIC AND A METAL ALLOY

Paul V. Kelsey, Jr., Idaho Falls, and William T. Siegel, Rigby, both of Id., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 24, 1981, Ser. No. 286,422
Int. Cl.³ C03B 29/00; C04B 33/34; B23K 31/02
U.S. Cl. 156—89 8 Claims

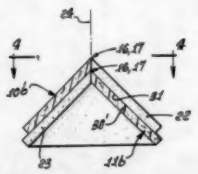
1. A method of fabricating a seal between a ceramic and a metal alloy comprising:
prefiring the alloy in a reducing atmosphere with an oxygen partial pressure less than or equal to 10^{-10} Pa,
cooling the alloy in said reducing atmosphere,
placing the ceramic in contact with the alloy,
firing the ceramic and alloy in air, and
cooling the ceramic and alloy to a temperature below a firing temperature but above ambient temperature, holding at said temperature for a set period of time, then cooling to ambient temperature whereby a seal is formed therebetween.

4,398,981

BRASSIERE PAD FABRICATION

Raymond J. Ellis, Northridge, Calif., assignor to Olga Company, Van Nuys, Calif.

Filed Mar. 3, 1981, Ser. No. 240,002
Int. Cl.³ A41C 3/00; B32B 31/04
U.S. Cl. 156—91 6 Claims



1. In the method of fabricating a brassiere pad, the steps that include:
(a) forming two generally circular sheet like blanks with notches having diverging edges, the blanks consisting essentially of lightweight fibrous batting and thermoplastic resin intermediate the fibers,
(b) connecting together said diverging edges of each blank

thereby to form said blank into a cone having a seam extending between the apex and the periphery of the cone,

(c) nesting the two cones into conical contact so that the seam of one cone is effectively rotated about 180° relative to the seam of the other cone, about an axis passing through the apices of the cones,

(d) applying heat and pressure to the nested cones to compress them against one another and substantially reduce their combined thickness thereby effecting their interconnection through at least partial melting of said resin, to form the pad into the shape of a dome, and to increasingly reduce said combined thickness from the crest of the dome toward a looping periphery defined by the dome,

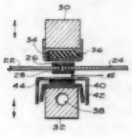
(e) said connecting together of the diverging edges of a blank being accomplished by loosely stitching together portions of the blank adjacent said edges, by employing plastic thread.

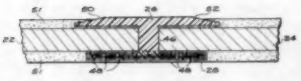
4,398,982

SPLICED WEB AND METHOD FOR FORMING A SPLICE

Peter C. Witerski, and Charles W. Pierson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,791
Int. Cl.³ B65H *69/02, 69/06*
U.S. Cl. 156—157 **10 Claims**





5. A method of forming a splice in a paper web to provide a spliced paper web having a face side that is capable of being continuously coated with a liquid coating composition with reduced splice-induced disturbance of the coating operation, said method comprising the steps of:

positioning first and second paper web portions in abutting end-to-end relationship;

applying a first splicing strip of a material meltable at a predetermined temperature between about 90° C. to 115° C. in overlying relationship with the abutting ends of the face side of the first and second paper web portions;

applying a second splicing strip of a material containing fibers meltable at a higher temperature than said predetermined temperature in overlying relationship with the side of the adjacent ends of the first and second paper web portions opposite the face side;

positioning a third splicing strip of material meltable at substantially said predetermined temperature in register with one side of said second splicing strip; and

subjecting the first and second paper web portions and overlying first, second and third splicing strips to a temperature between said predetermined and higher temperatures and a predetermined pressure to splice the web portions together by melting the first splicing strip for filling the space between the abutting first and second paper web portions and partially impregnating said web portions, forming slight trailing and leading ramp surfaces of gradually decreasing thickness on the face side of the paper web portions which blend smoothly with the face side, embedding the fibers of said second splicing strip into the opposite side of the paper web portions, and melting the third splicing strip for adhering the fibers to the paper web portions.

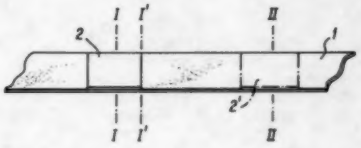
8. A method according to claim 5 wherein said second splicing strip is formed from a polyester material.

4,398,983

BINDING METHOD USING ADHESIVE TAPE

Tomosaburo Suzuki, Tsukui, and Akira Wakahara, Hino, both of Japan, assignors to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,579
Claims priority, application Japan, Jul. 1, 1980, 55-89852
Int. Cl.³ B65B *13/02*; B65H *81/00*
U.S. Cl. 156—185 **5 Claims**



1. A binding method using an adhesive tape, said method comprising:

forming a first tape having at least one adhesive surface;

positioning individual pieces of second tape on an adhesive surface of said first tape at predetermined intervals;

cutting said first tape at said predetermined intervals to form tape segments having pieces of said second tape on at least one end; and

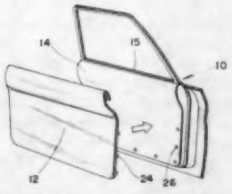
winding one said tape segment about an article to be bound so that the ends of said tape segment face one another, whereby said second tape prevents adhesion of said ends of said tape segment.

4,398,984

METHOD OF PRODUCING ARTICLE HAVING SECONDARY PART ADHERED TO PRESS-FORMED METAL PART

Toshihiko Uchiyama, Yokohama; Eizo Yoshida, Chigasaki, and Toshiki Okuyama, Oiso, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 10, 1981, Ser. No. 272,374
Claims priority, application Japan, Jun. 12, 1980, 55-78316
Int. Cl.³ B31F *1/00*; C09J *5/04*
U.S. Cl. 156—196 **11 Claims**



1. A method of producing an article having a structurally primary part formed of a metal sheet and a structurally secondary part adhered to the primary part with an adhesive, the method comprising the steps of:

forming the primary part by press-forming of a metal sheet to which a lubricant is applied beforehand, said lubricant containing an organic polymeric substance as a principal component thereof;

applying an adhesive having a principal component which has a high chemical affinity for the principal component of

said lubricant to a surface of the press-formed primary part with said lubricant being retained thereon, said adhesive being selected from the group consisting of a nitrile rubber, a polyurethane rubber and a vinyl polymer; and

adhering the secondary part to the adhesive-applied surface of the primary part.

4,398,985

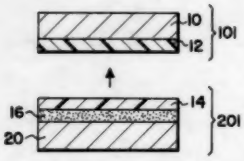
RELEASABLE, SELF-DETACKIFYING LAMINATE CONSTRUCTION

Bevery M. Eagon, Tipp City, Ohio, assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 119,712, Feb. 8, 1980, abandoned. This application Nov. 19, 1981, Ser. No. 322,830

Int. Cl.³ B32B *31/04, 31/12*

U.S. Cl. 156—233 **10 Claims**



1. A method of preparing a self-detackifying laminate construction comprising the steps of:

coating of least one surface of a face stock sheet with a layer of a nonsilicone containing release polymer,

applying to the coated face stock sheet a release additive in the form of a film of a nonsilicone containing polymer to form a subassembly,

coating a substrate with a layer of adhesive, and

laminating the adhesive-coated surface of said substrate to the release additive-coated surface of said subassembly to form a laminate, said release additive being releasable from said coated face stock sheet upon the application of a delaminating force less than the force required to separate said release additive from said adhesive or said adhesive from said substrate.

9. A method of preparing a label, tag, or business, membership, or credit card comprising the steps of:

coating at least one surface of said label, tag, or business, membership, or credit card with a layer of a nonsilicone containing release polymer,

applying to the coated label, tag, or business membership, or credit card a release additive in the form of a film of a nonsilicone containing polymer to form a subassembly,

coating a substrate with a layer of adhesive,

laminating the adhesive-coated surface of said substrate to the release additive-coated surface of said subassembly to form a laminate,

printing on the exposed face of said subassembly, and

delaminating the printed and coated label, tag, or business, membership, or credit card from said laminate at the interface between said coated label, tag, or business, membership, or credit card and said film of release additive to provide a detackified tag, label, or business, membership, or credit card.

4,398,986

BINDING METHOD

Robert C. Smith, Jr., and James A. McGlen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 13,869, Feb. 22, 1979, Pat. No. 4,343,673. This application May 10, 1982, Ser. No. 376,357

Int. Cl.³ B32B *31/00*

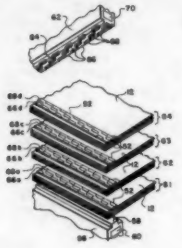
U.S. Cl. 156—290 **1 Claim**

1. A method for securing together a plurality of sheets having a heat-sealable material positioned on adjacent surfaces of the sheets, the method comprising the steps of:

supporting a first group of unattached sheets in overlapping relation with the material located between adjacent sheets and in contact with at least one of each two adjacent sheets;

selectively heating a first portion of the material between the sheets to a temperature sufficient to effect bonding of the material to the sheets, thereby securing together adjacent sheets in the first group of sheets;

placing over the first group of sheets a second group of unattached sheets with said material located between adjacent sheets of the second group and in contact with one sheet of the first group; and



selectively heating a first portion of the material between sheets of the second group and between the second group and one sheet of the first group to a temperature sufficient to effect bonding of the material to the sheets, thereby securing together adjacent sheets in the second group and the first and second groups of sheets, the first portion of the material of the second group of sheets being offset from the first portion of the material in the first group of sheets so that heat transferred through the second group of sheets to the first group of sheets will be primarily in an area outside of the first portion of the material in the first group.

4,398,987

CONTINUOUS PRODUCTION OF ELECTRICAL LAMINATES

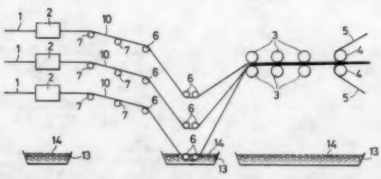
Masayuki Oizumi; Masaharu Abe, both of Kobe, and Yasuo Fushiki, Takatsuki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1981, Ser. No. 286,846

Claims priority, application Japan, Jul. 28, 1980, 55-104212; Jul. 28, 1980, 55-104213

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—324 **6 Claims**



1. In a method for continuous production of a laminated sheet product comprising transporting a plurality of continuous sheet component materials in vertically discrete relation, supplying an impregnating resin to each of said component materials, joining the resin-impregnated component materials with a joining device to give an assembly and laminating a film material to either side of said assembly, all in continuous se-

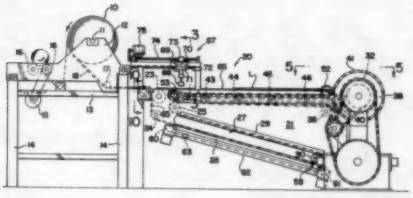
quence, the improvement wherein said resin-impregnated component materials are first transported in a substantially horizontal path, a declining path, at least one substantially upstanding V-shaped or U-shaped path, and finally an ascending path before said component materials are joined, so that excess resin squeezed out by the joining device flows down under gravity to avoid excessive accumulation thereof in the joining device.

4,398,988

TIRE BUILDING APPARATUS

Claude Mullender, Barberton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,805
Int. Cl.³ B29H *17/20, 17/18*
U.S. Cl. 156—405.1 10 Claims



1. In an automatic ply applier having a support means, ply stock supply means mounted on one end of said support means, a shaft mounted on the other end of said support means, a tire building drum mounted on said shaft, belt drive rings journaled on said shaft for rotation thereon, a plurality of rollers mounted on said support means, an idler roll mounted on said belt rings for rotation therewith around said shaft, an endless conveyor means mounted on said support means and trained about said rollers and said idler roll, one of said plurality of rollers being moveable in a linear direction, and power operated means connected to said drum and said belt rings to selectively rotate said drum and said belt rings in synchronism for a first predetermined amount of rotation followed by the sole rotation of said drum a second predetermined amount, and said drum being in frictional contact with said endless conveyor means to transfer ply stock from said conveyor means to said drum upon continued rotation of said drum to effect a wrapping around of the ply stock resting on said conveyor means about said drum during actuation of said power operated means.

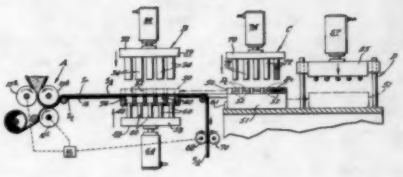
7. In an automatic ply applier having support means, ply stock supply means mounted on one end of said support means, a tire building drum mounted on the other end of said support means, a belt ring journaled on each end of said drum, drive means connected to said tire building drum and said belt rings for selectively rotating said drum and rings simultaneously and thence rotating said drum relative to said rings, an idler roller journaled for rotation on said belt rings and for arcuate movement therewith, a plurality of rolls mounted on said support means, endless conveyor belt means trained on said rolls and said idler roller for movement thereon, motive means operably connected to said endless conveyor belt means for moving said belt in an orbital movement, certain ones of said rolls mounted for linear movement on said support means and for rotation around said belt rings in cooperation with rotation of said idler roller with said belt rings to wrap a portion of said endless belt means about said drum by said drive means, cut-off means mounted on said one end of said support means for severing a predetermined length of ply stock on said conveyor belt means.

4,398,989

SYSTEM FOR MAKING MOLDED ARTICLES

Roland M. Allen, Kenilworth, and Andrew J. Kalocai, Pottstown, both of Pa., assignors to The West Company, Phoenixville, Pa.

Continuation of Ser. No. 185,586, Sep. 9, 1980, which is a continuation of Ser. No. 895,244, Apr. 10, 1978, abandoned, which is a continuation of Ser. No. 743,007, Nov. 18, 1976, abandoned, which is a division of Ser. No. 473,216, May 24, 1974, abandoned. This application Mar. 2, 1982, Ser. No. 354,058
Int. Cl.³ B29C *3/00*
U.S. Cl. 156—500 9 Claims



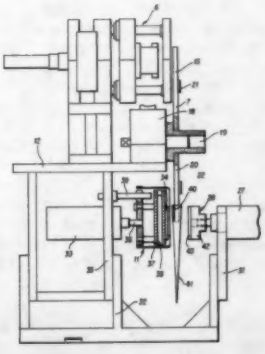
1. A system for making molded articles including a body portion of elastomeric material and a liner of an inert material covering at least a portion of the peripheral surface of the body portion; comprising a forming station including means for bonding a layer of the elastomeric material to one face of a layer of the inert material and means for forming the laminated layers to at least one clad element configuration, a loading station including means for positioning the clad element in at least one cavity of a mold with the layer of inert material contacting at least a portion of the surface of the mold cavity, and a molding station including means for charging the mold cavity with additional amounts of uncured elastomeric material and means for curing the elastomeric material to produce the finished article.

4,398,990

APPARATUS FOR SEALING A LAMINA ONTO A PLASTIC BAG

Heinz Kühni, Burgdorf, and Peter Schwaninger, Kirchberg, both of Switzerland, assignors to Ivers-Lee AG, Berne, Switzerland

Filed Apr. 7, 1981, Ser. No. 251,964
Claims priority, application Switzerland, Apr. 15, 1980, 2891/80
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—510 4 Claims



1. Apparatus for sealing a lamina onto a plastic bag, comprising feed means for feeding said bag to said apparatus, conveyor

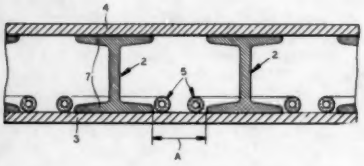
means for transporting at least one said lamina into the vicinity of said bag, and heatable sealing means for sealing said lamina onto a side of said bag, wherein said conveyor means comprise a lever having two ends and pivotable about an axis, and at least one heating element respectively disposed on each of said two lever ends.

4,398,991

HEATING PLATEN FOR A BELT PRESS

Peter Thies, Ennepetal-Voerde, Fed. Rep. of Germany, assignor to Wagener Schwelm GmbH & Co., Schwelm, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,435
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040372
Int. Cl.³ B30B *15/34*
U.S. Cl. 156—583.1 5 Claims



1. A press platen for a belt-repair or belt-end-joining press comprising:

a four-sided frame formed by a pair of opposite longitudinal edge members, a pair of opposite transverse edge members, and a plurality of equispaced intermediate members extending parallel to said longitudinal edge members, all of said edge members having the same cross section, all of said intermediate members having the same cross section;

a heating plate coextensive with the periphery of said frame and secured thereto along a side of said plate adapted to engage material to be pressed;

a cover plate coextensive the periphery of said frame and secured thereto along a side of said platen turned away from said material; and

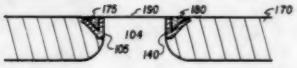
a flat electrical heating element lying against said heating plate, said heating element including longitudinal passes extending along said longitudinal and intermediate members with two such passes disposed in each space between intermediate members and between an intermediate member and a longitudinal edge member, bights of said heating element lying along said transverse edge member, said heating plate being formed with transverse heating zones along transverse edges of the platen, longitudinal heating zones along longitudinal edges of the platen, and corner heating zones between each end of a transverse heating zone and an end of a longitudinal heating zone, and a central heating zone surrounded by said corner, longitudinal and transverse heating zones, said central heating zone being formed from a plurality of parallel intermediate heating zones each of which is centered over a respective one of said intermediate members, said frame and said plates having configurations such that the specific material volume is the same in all of said zones, said heating element including bends at said corner heating zones, the specific heat output of said element being uniform over the area of said heating plate.

4,398,992

DEFECT FREE ZERO OXIDE ENCROACHMENT PROCESS FOR SEMICONDUCTOR FABRICATION

Robert C. Y. Fang, Newark, and Kuang Y. Chiu, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 20, 1982, Ser. No. 380,195
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 8 Claims



1. A method for producing a semiconductor structure comprising the steps of:

removing a portion of a semiconductor substrate to form a mesa-like shape with a flat top in the same plane as said substrate, said mesa being surrounded by a trench region in said substrate;

forming multiple layers of covering materials over said mesa and said trench;

removing said layers of covering materials so that a coating of said materials remains over the top and sides of said mesa, and extending into said trench region at least to a width substantially equal to the total thickness of said multiple layers;

oxidizing the exposed surface of said substrate to form an oxide thereon; and

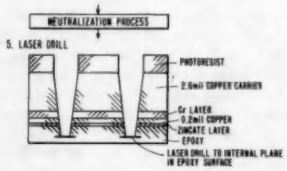
removing the remainder of said covering materials and oxide, to expose the top surface of said mesa to form an essentially flat surface of oxide and covering materials in the same plane as the top of said mesa.

4,398,993

NEUTRALIZING CHLORIDE IONS IN VIA HOLES IN MULTILAYER PRINTED CIRCUIT BOARDS

David W. Hume, Jr., and John Rasile, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,849
Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 6 Claims



1. The process of drilling blind via holes in a printed circuit board composite which consists of a peel-apart-copper layer covering an epoxy substrate which consists of the steps of:

etching holes through the peel-apart-copper layer;

subjecting said holes to a circulating Neutra-Clean solution;

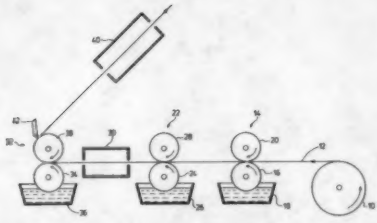
cleaning said holes to remove said Neutra-Clean solution; and

utilizing a laser drill to extend said etched holes into the epoxy substrate.

4,398,994
FORMATION OF PACKAGING MATERIAL

Donald E. Beckett, 963 Tennyson Ave., Mississauga, Ontario L5H 2Y9, Canada

Filed Sep. 15, 1981, Ser. No. 302,370
Int. Cl.³ C23F 1/02
U.S. Cl. 156—659.1 **8 Claims**



1. A continuous method of forming a repetitive pattern on a roll of aluminized polymer film which comprises:
(a) continuously feeding a web of said aluminized polymer film from said foll at a web speed of up to about 1000 ft/min;
(b) printing said web with a pattern of etchant-resistant material corresponding to the pattern desired on the aluminized surface thereof;
(c) applying aqueous sodium hydroxide solution having a concentration of up to about 25 wt % at a temperature of about 15° to about 100° C. across the whole width of the web to contact the pattern on the web;
(d) allowing said sodium hydroxide solution to remain in contact with said web as it is conveyed for about 0.1 to about 10 seconds to permit said sodium hydroxide to dissolve aluminum only from areas of said web not having said pattern of etchant-resistant material applied thereto;
(e) washing the spent sodium hydroxide solution from said web to leave said pattern of etchant-resistant material on a transparent polymeric film; and
(f) drying the resulting washed web.

4,398,995
PAPERY PRODUCT

Hideharu Sasaki, Iwakuni; Tsutomu Nakamura, Yamaguchi; Keizo Shimada; Yuzo Aito, both of Iwakuni, and Yutaka Tabe, Matsuyama, all of Japan, assignors to Teijin Limited, Yamaguchi, Japan

Filed May 20, 1981, Ser. No. 265,583
Claims priority, application Japan, May 26, 1980, 55-68979
Int. Cl.³ D21H 5/20
U.S. Cl. 162—157.3 **8 Claims**

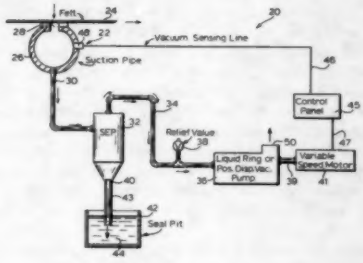
1. A papery product consisting essentially of a fibrous web, at least part of said web being made of a wholly aromatic polyamide fiber having a core comprising an aromatic polyamide material extending along the longitudinal axis of said fiber and a sheath, surrounding said core, comprising the same aromatic polyamide material as said core, said core being substantially insoluble and said sheath being substantially soluble in N-methyl-2-pyrrolidone at a temperature of 35° C., pressure and heat having been applied to said web.

4,398,996
VACUUM CONTROL SYSTEM AND METHOD FOR DEWATERING FABRICS

Joseph A. Bolton, Glens Falls, and Jeffrey B. Duncan, Argyle, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,299
Int. Cl.³ D21F 1/48, 11/02
U.S. Cl. 162—198 **14 Claims**

1. A vacuum dual control system for dewatering a press felt on a papermaking machine comprising; a suction pipe, a vacuum pump operatively connected to the suction pipe in a manner so that the vacuum applied to the pipe is a function of the speed of the pump and said vacuum pump operated by first control means to run at an initial substantially constant high speed for providing vacuum necessary to dewater said press felt at its new felt permeability, means for setting the pump to run at a substantially constant maximum speed for a new felt permeability, means for passing the felt over a slot in the suction pipe so that suction applied therethrough by the pump operating at its initial substantially constant high speed will dewater the felt until felt permeability decreases sufficiently to cause the vacuum level in the suction pipe to increase to a predetermined maximum level as determined by a set point of a second control means, and the second control means connected to the suction pipe and to the vacuum pump and including sensing means to sense the vacuum level reaching the maximum level as determined by the second control means set point, and means for terminating operation of said first control means and initiating operation of said second control means in response to the sensing means sensing the vacuum level reaching the predetermined maximum level as determined by the second control means set point said second control means including means to lower the speed of the vacuum pump and maintain said predetermined maximum vacuum level.



8. A method of controlling vacuum conditions for dewatering a press felt on a papermaking machine by use of a dual control system comprising; interconnecting a suction pipe with a vacuum pump in a manner so that the vacuum applied to the pipe is a function of the speed of the pump, operating the vacuum pump by a first controller to run the pump at an initial substantially constant high speed for providing vacuum necessary to dewater said press felt at its new felt permeability, passing the felt over a slot in the suction pipe so that suction applied therethrough by the pump operating at its initial high speed will dewater the felt until felt permeability decreases sufficiently to cause the vacuum in the suction pipe to increase to a predetermined maximum level as determined by a set point of a second controller connected to the suction pipe and to the vacuum pump and including a sensor to sense the vacuum level reaching the maximum level as determined by the second controller set point, and lowering the speed of the vacuum pump to maintain the maximum vacuum level by terminating use of the first controller and instituting use of the second controller in response to the sensor sensing the vacuum level reaching the maximum level as determined by the second controller set point.

4,398,997

EXTENDED NIP PRESS

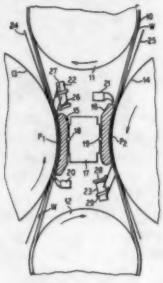
Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 115,010, Jan. 24, 1980, Pat. No. 4,308,096. This application Sep. 16, 1981, Ser. No. 302,779

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ D21F *3/02*

U.S. Cl. 162—274 **9 Claims**



1. A wet press mechanism for removing liquid from a traveling fibrous web comprising in combination:

a press nip formed between first and second members for receiving a traveling web therebetween;

one of said members being a traveling flexible impervious belt;

force means engaging the surface of said belt including a sliding shoe having a surface facing the belt with said surface extending transversely across the belt and being of a width less than the belt and also extending in the direction of belt travel to form an extended nip press;

means for pressing the shoe toward the belt with a predetermined force whereby the belt is compressed opposite the shoe and is uncompressed laterally of the shoe;

means for providing a film of lubricating fluid between the shoe and the belt;

means for receiving liquid pressed from the web between said members;

and means positioned laterally of the shoe opposite the uncompressed portion of the belt for removing lubricant from the surface of the belt at the uncompressed belt area which lubricant has passed laterally alongside the shoe.

4,398,998

APPARATUS FOR RECOVERING ENERGY AND USEFUL PRODUCTS FROM PLANTAIN WASTES

Babington A. Quame, 331 E. 29th St., New York, N.Y. 10016

Filed Feb. 19, 1982, Ser. No. 350,294

Int. Cl.³ B09B *3/00*; C10C *5/00*; F23B *1/14*; F23G *9/00*

U.S. Cl. 202—94 **11 Claims**

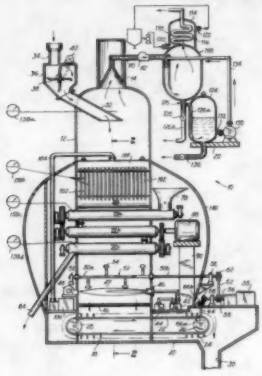
1. Apparatus for recovering energy and useful products from waste raw material comprising:

a housing having a burner provided at a lower firing region thereof and a gas discharge opening at an upper region thereof;

a furnace disparate from but situated within said housing in the path of flue gas generated at said firing region, said furnace including an inlet region adapted to receive a mass of mixed material, an outlet region, and means for stirring the mass of mixed material as the same is transported from said inlet region to said outlet region thereof, said flue gas transferring heat to the mass of mixed material received within said furnace to form useful compounds;

means for transferring solid residue from said firing region of said housing to said inlet region of said furnace as a component of said mixed material;

means for generating steam situated within said housing, said steam generating means being located in the path of flue gas generated at said firing region, said steam generating



means including a water reservoir, and said flue gas transferring heat to the water contained within said reservoir to generate steam useful for producing energy; and

means for condensing the flue gas generated at said firing region and for recovering any remaining flue gas.

4,398,999

COKE-OVEN BATTERY HAVING TIE COOKING MEMBERS

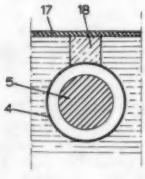
Jacobus van Laar, Santpoort; Timen Vander, Ursem; Johannes A. Kroes, Amsterdam, and Pieter G. Broersen, Lisse, all of Netherlands, assignors to Estel Hoogovens BV, Netherlands

Filed Jan. 21, 1982, Ser. No. 341,269

Claims priority, application Netherlands, Jan. 21, 1981, 8100261

Int. Cl.³ C10B *29/00, 29/04, 29/08*

U.S. Cl. 202—267 R **6 Claims**



1. Coke oven battery having

a pusher side and a coke side;

a continuous oven roof extending between said sides and having an upper side;

a plurality of uprights on each of said pusher and coke sides;

a plurality of ties respectively connecting said uprights on the pusher side with said uprights on the coke side and extending through the oven roof;

a plurality of pipes embedded in said oven roof and housing said ties; and

for each said pipe, at least one metal cooling member in contact with said pipe and said upper side of the oven roof, thereby forming a heat transfer path from said pipe to said upper side of the oven roof, said metal cooling member being arranged and constructed to reduce the

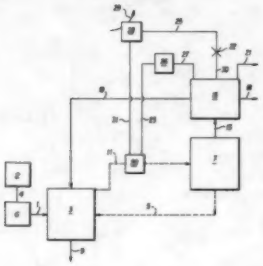
temperature of an otherwise uncooled tie by an average of around 200° C. during operation of the coke oven battery.

4,399,000

PROCESS FOR PRODUCING ABSOLUTE ALCOHOL BY SOLVENT EXTRACTION AND VACUUM DISTILLATION

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Oct. 7, 1981, Ser. No. 309,258
Int. Cl.³ C07C 27/34
U.S. Cl. 203—19 13 Claims



1. A method for producing alcohol substantially free of water, comprising:

extracting an aqueous alcohol solution with an organic solvent system comprising an organic solvent and an extractant for said alcohol selected from the group consisting of a symmetric or asymmetric alkyl or aryl phosphate, a phosphonate, a phosphine oxide, a sulfoxide, a sulfone, an amine oxide or a quarternary ammonium or phosphonium salt in a ratio of 1 to 10 parts by weight solvent to one part by weight extractant, thereby forming an organic solvent-alcohol phase and an aqueous phase; and

vacuum distilling said organic solvent-alcohol phase thereby obtaining the product alcohol substantially free of water.

4,399,001

SEPARATING OFF ORGANIC IODINE COMPOUNDS FROM ACETALDEHYDE-FREE CARBONYLATION PRODUCTS OF METHANOL, METHYL ACETATE AND DIMETHYL ETHER

Horst Hartmann, Boehl-Iggelheim; Waldhelm Hochstein, Freinsheim; Gerd Kaibel, Lampertheim, and Franz-Josef Mueller, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,726
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045081
Int. Cl.³ B01D 3/36
U.S. Cl. 203—70 8 Claims

1. A process for separating off organic iodine compounds as an impurity from acetaldehyde-free carbonylation products of methanol, methyl acetate and dimethyl ether, which process comprises:

removing the organic iodine impurity by azeotropic distillation of the acetaldehyde-free carbonylation product with a hydrocarbon having a boiling point, under atmospheric pressure, of 25°–50° C., said distillation being carried out under conditions of temperature and pressure sufficient to obtain substantially all of the organic iodine impurity in the azeotrope distillate fraction and to obtain the remaining carbonylation products in one or more higher boiling fractions.

4,399,002

LARGE ORGANIC CATION-SELECTIVE ELECTRODES

Henry Freiser, Tucson, Ariz., and Charles R. Martin, Austin, Tex., assignors to University Patents, Inc., Norwalk, Conn.

Filed Feb. 27, 1981, Ser. No. 239,081
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 22 Claims

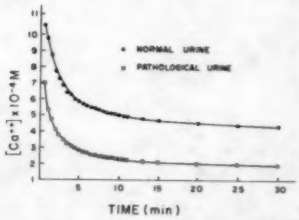
1. In a cation-selective electrode for use in measuring the concentration of an organic cationic species in an aqueous test solution as a function of potentiometric response, comprising a cation-selective membrane adapted for interfacing with said test solution and either formed as a layer on a conductive substrate or in electrical contact with an internal reference electrode element, said membrane being composed of a polymeric matrix having dispersed or dissolved therein a cation-exchange material, the improvement which comprises said cation exchange material having as its counter-anion a high molecular weight alkyl or alkaryl sulfonate or sulfate of the formula $R(O)_nSO_3^-$, wherein n is 0 or 1, R is an alkyl group having at least 13 carbon atoms or an alkaryl group of the formula $R_1—Ar—R_2$, Ar is an aryl group, R_1 is an alkyl group, and R_2 is an alkyl group or H, with the proviso that when Ar is monocyclic and R_1 has less than 12 carbon atoms, R_1 and R_2 are each the same or different alkyl groups having at least 9 carbon atoms, and when Ar is polycyclic and R_1 has less than 10 carbon atoms, R_1 and R_2 are each the same or different alkyl groups having at least 7 carbon atoms, whereby said electrode has a high degree of selectivity for large organic cationic species with respect to both smaller organic cationic species and inorganic cationic species.

4,399,003

METHOD AND KIT FOR DIAGNOSING A PATIENT'S PRONENESS TO DEVELOP CALCIUM OXALATE KIDNEY STONES

Sara Sarig; Nissim Garti, both of Jerusalem, and Francoise Tibika, Ashdod, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Apr. 23, 1981, Ser. No. 256,777
Claims priority, application Israel, May 2, 1980, 59982
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 11 Claims



1. A method of diagnosing a patient's proneness to develop kidney stones of the calcium oxalate type, which comprises forming an aqueous reaction medium comprising from about 5 to about 20% by volume of a sample of the patient's urine, said medium having an ionic strength of from about 0.01 to about 0.1 and containing calcium ions at a concentration of from about 1 to about 5 mM/l and oxalate ions at a concentration of from about 1 to about 7 mM/l; measuring by means of a calcium ion-specific electrode the rate of decrease of the calcium ion concentration and comparing the thus measured rate with the corresponding rate determined with a reference sample of normal urine, as herein defined.

11. A kit for carrying out the method according to claim 1, said kit comprising packaged synthetic urine solution and packaged aqueous sodium oxalate solution, and further com-

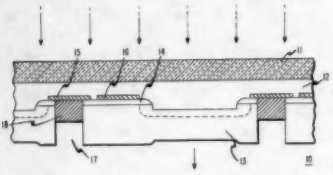
prising a calcium ion-specific electrode and a reference electrode.

4,399,004

PHOTOELECTROCHEMICAL GOLD PLATING PROCESS

Reginald R. Buckley, Summit; Lucian A. D'Asaro, Madison; Paul A. Kohl, Chatham; Frederick W. Ostermayer, Jr., Chatham, and Catherine Wolowodiuk, Chatham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,517
Int. Cl.³ C25D *5/02, 7/12*
U.S. Cl. 204—15 **18 Claims**



1. A process for fabricating devices comprising at least one n-type or intrinsic III–V compound semiconductor material comprising at least one step in which gold is plated on a metallic surface electrically connected to the III–V compound semiconductor by a oxidation-reduction reaction in an electrolytic solution characterized in that

a. the oxidation is carried out by illuminating the III–V compound semiconductor with light with photon energy at least as great as the band gap of the compound semiconductor so as to create holes that permit oxidation of the semiconductor

b. the electrolytic solution comprises a source of gold which on reduction yields metallic gold, and

c. the source of gold is reduced on the metallic surface to form metallic gold.

4,399,005

METHOD OF NICKEL ELECTRODE PRODUCTION

David H. Fritts, Dayton, and John F. Leonard, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 21, 1981, Ser. No. 333,216
Int. Cl.³ H01M *4/04;* **C25D** *11/00*
U.S. Cl. 204—2.1 **7 Claims**

1. A process for making a nickel electrode which comprises the steps of:

(a) immersing a porous, electrically conductive plaque in an electrolyte bath provided with a counter-electrode, said bath comprising an aqueous solution of nickel nitrate;

(b) forming the conductive plaque against the said counter-electrode at a desired current density;

(c) continuously adding, at a desired rate, an aqueous solution of zinc nitrate to said electrolyte bath; and

(d) continuing said forming step (b) and said addition step (c) for a time sufficient to convert the metal nitrates in the pores of said plaque to a desired level of the corresponding metal hydroxides.

4,399,006

SILVER PLATING

Fred I. Nobel, Sands Point, and William Brasch, Commack, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 937,849, Aug. 29, 1978, Pat. No. 4,247,372.
This application Jul. 19, 1979, Ser. No. 59,116
Int. Cl.³ C25D *3/46, 5/10, 5/34*
U.S. Cl. 204—29 **6 Claims**

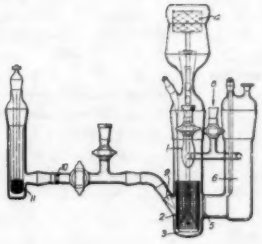
4. The process of electrodepositing silver on a copper or copper alloy conductive substrate which comprises as a step of said process treating the substrate with a mercaptan compound in the absence of a silver compound, and as a subsequent step of said process electroplating silver thereover with a silver cyanide plating solution containing 10 g/l of free cyanide or less or a silver thiosulfate plating solution containing 5 g/l of silver metal or less.

4,399,007

HYDROGENATION

Albert Fröling, Vlaardingen; Rudolph O. de Jongh, The Hague, and Josephus M. A. Kemps, Udenhout, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 2,048, Jan. 8, 1979, Pat. No. 4,326,932, which is a continuation of Ser. No. 866,147, Dec. 30, 1977, abandoned. This application Jun. 17, 1981, Ser. No. 274,578
Claims priority, application United Kingdom, Dec. 31, 1976, 54485/76
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ C25B *3/04;* **C11C** *3/12*
U.S. Cl. 204—59 R **23 Claims**



1. Process for the selective hydrogenation of a polyunsaturated organic compound containing more than one double bond in a carbon chain or ring comprising hydrogenating said compound with molecular hydrogen in the presence of a metallic hydrogenation catalyst and applying an external electric potential differing from the equilibrium potential and having a value of between 0 V and −3 V as measured against a saturated calomel electrode to the catalyst while it is in contact with a liquid, which liquid contains an electrolyte.

4,399,008

COMPOSITION FOR INERT ELECTRODES

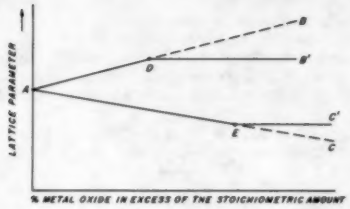
Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 10, 1980, Ser. No. 205,652
Int. Cl.³ C25C *3/00, 7/00*
U.S. Cl. 204—67 **41 Claims**

37. In an improved process for the electrolytic production of metal from a metal compound dissolved in a molten salt using an inert electrode, the improvement comprising:

electrolyzing the metal compound using an inert electrode fabricated from two metal oxides combined to provide an anode metal oxide composition wherein one of the two metal oxides is selected from the group consisting of NiO, SnO_2, ZrO_2, ZnO, CoO, MnO, TiO_2 and Ta_2O_5, the composition containing a material having the formula

$M(M'_yM_{1-y})_zO_K$ where y is a number in the range of about $0.1 \leqq y \leqq 0.4$ and $0.6 \leqq y \leqq 0.9$, M is a metal having a valence selected from the group consisting of 2, 3, 4 and 5, M' is a metal having a valence selected from the group consisting of 2, 3, 4 and 5, M and M' being different metals,



O is oxygen, z is a number selected from the group consisting of 2, 3 and 4, and K is a number in the range of 2 to 4.4, an anode formulated from said composition being highly conductive and being inert with respect to said molten salt.

4,399,009

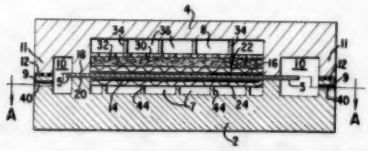
ELECTROLYTIC CELL AND METHOD

Raymond S. Chisholm, Pittsburgh, Pa., assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 226,202, Jan. 19, 1981, Pat. No. 4,331,521. This application Dec. 29, 1981, Ser. No. 335,371

Int. Cl.³ C25B *1/34, 9/00, 13/02, 13/08*

U.S. Cl. 204—98 **16 Claims**



1. A method of generating halogen and hydrogen which comprises electrolyzing an aqueous halide in an electrolytic cell having an anode and a cathode separated by a diaphragm comprising a first layer of a fluorocarbon polymer on the anode side of said diaphragm and having cation exchange groups linked to a fluorocarbon polymer chain and a second layer or section between the cathode and the first layer, said second layer having cation exchange groups linked to a second polymer chain, said second chain having a lower fluorine content than said first chain.

4,399,010

ISOTOPE SEPARATION APPARATUS

Richard K. Lyon, Fanwood; Philip N. Eisner, New Providence, and William R. I. Thomas, Holmdel, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 659,930, Feb. 20, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 877,877

Int. Cl.³ B01D *59/00*

U.S. Cl. 204—157.1 R **5 Claims**

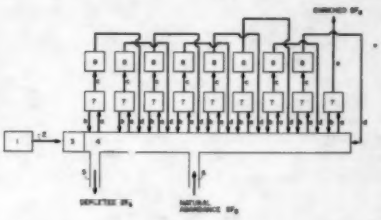
1. A method of operating upon molecules of a compound which includes isotopes of an element having an isotopically shifted infrared absorbtion spectrum associated with said element to provide a product which is enriched in one of the isotopes of said element including the steps of:

(1) defining an irradiation path, said irradiation path having a beginning and an end;

(2) introducing said compound into said irradiation path at a first introduction point between said beginning and said end and flowing said compound toward said end;

(3) irradiating said irradiation path with infrared radiation which is preferentially absorbed by molecular vibrations of said molecules of said compound containing a predetermined isotope of said element, thereby converting said compound to said product in an isotopically selective manner;

(4) removing said product from said irradiation path at a first removal point between said first introduction point and said end;



(5) converting said product removed at said removal point into said compound thereby providing a first stage enriched compound;

(6) introducing said first stage enriched compound into said irradiation path at a second introduction point between said beginning and said first introduction point; and

(7) removing said product from said irradiation path at a second removal point between said second introduction point and said first introduction point.

4,399,011

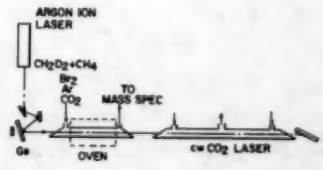
SEPARATION OF HYDROGEN ISOTOPES

David S. Y. Hsu, Clinton, and Thomas J. Manuccia, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1981, Ser. No. 250,998

Int. Cl.³ C01B *3/32;* **B01D** *59/00*

U.S. Cl. 204—163 R **8 Claims**



1. A method for separating hydrogen isotopes which comprises:

forming a gas mixture comprising bromine atoms, normal and deuterated alkane molecules, a vibrationally excited sensitizer gas selected from the class consisting of carbon dioxide, carbon monoxide, nitrogen, and mixtures thereof and a deactivator gas in an amount sufficient to compete with VV pumping by the sensitizer gas whereby said deuterated alkane molecules become vibrationally excited by V—V vibration transfer from said sensitizer molecules;

reacting both alkane molecules with bromine atoms, to form a bromoalkane, whereby vibrationally excited deuterated alkane molecules react at a faster rate than protonated alkane molecules; and

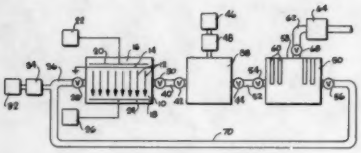
separating deuterated bromoalkane.

4,399,012

NITROGEN FIXATION METHOD AND APPARATUS

Hao-Lin Chen, Walnut Creek, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 11, 1981, Ser. No. 291,899
Int. Cl.³ C01B 21/30, 21/24, 21/48
U.S. Cl. 204—179 5 Claims



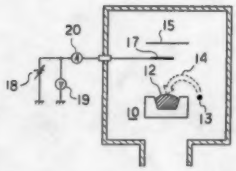
1. A method of nitrogen fixation, comprising:
providing an electric discharge chamber which produces a substantially equal volumetric electron discharge therein;
maintaining said discharge chamber at a voltage to pressure ratio of about 5 to 15 kV/atm of O_2/cm;
introducing air into said discharge chamber;
passing an electrical discharge through said discharge chamber while air is disposed therein;
forming O and vibrationally excited N_2 in said discharge chamber;
interacting O and vibrationally excited N_2 within said discharge chamber to form NO and N;
interacting N and O_2 within said discharge chamber and form NO and O; and
removing NO from said discharge chamber prior to its decomposition.

4,399,013

METHOD OF PRODUCING A MAGNETIC RECORDING MEDIUM

Ryuji Sugita, Hirakata, and Toshiaki Kunieda, Minoo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 4, 1981, Ser. No. 240,369
Claims priority, application Japan, Mar. 7, 1980, 55-29616; Apr. 14, 1980, 55-49374; Jun. 11, 1980, 55-79548
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 N 5 Claims



1. A method of producing a perpendicular magnetic recording medium, including a step of forming a magnetic layer as a thin film composed predominantly of cobalt and chromium on a substrate, wherein said thin film is formed by vacuum vapor deposition under conditions which comprise:
producing a vapor composed predominantly of cobalt and chromium from an evaporation source, causing electrons to be produced in proximity to said evaporation source and causing these electrons to reach the substrate surface in an amount sufficient to cause the atoms of vaporized film-forming material at or near the substrate to be in the discharge state.

4,399,014

PLASMA REACTOR AND METHOD THEREFOR

Frank W. Engle, 525 Mission Dr., Pleasanton, Calif. 94566

Continuation-in-part of Ser. No. 152,688, May 3, 1980, Pat. No. 4,289,598. This application Aug. 11, 1981, Ser. No. 291,917
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E 20 Claims

1. A plasma reactor suitable for conditioning workpieces in a gas discharge plasma, comprising:
a vacuum vessel having a chamber therein;
at least one series of electrodes sin said vacuum vessel chamber, said series of electrodes being disposed along one side of a workpiece and having electrodes of alternate polarities; and
means for supporting at least one workpiece to be conditioned in said plasma reactor alongside said series of electrodes.

4,399,015

METHOD FOR FABRICATING AN INDIUM TIN OXIDE FILM FOR A TRANSPARENT ELECTRODE

Yoshihiro Endo; Yoshito Yamashita; Hiroshi Kishishita, all of Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1982, Ser. No. 344,520
Claims priority, application Japan, Feb. 3, 1981, 56-15410
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 P 10 Claims

1. A method for fabricating an indium tin oxide (ITO) film, comprising:
depositing the ITO film on a heated substrate which is heat-resistant by sputtering using a metal alloy target of In-Sn in an atmosphere including an active gas having a moderate partial pressure of oxygen; and
heat-treating the ITO film at about 550°–650° C. in an oxygen-free atmosphere.

4,399,016

PLASMA DEVICE COMPRISING AN INTERMEDIATE ELECTRODE OUT OF CONTACT WITH A HIGH FREQUENCY ELECTRODE TO INDUCE ELECTROSTATIC ATTRACTION

Tsutomu Tsukada, and Hideo Takei, both of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,216
Claims priority, application Japan, Mar. 12, 1981, 56-35741
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 14 Claims

1. In a plasma device for processing a sample by the use of plasma, comprising a chamber defining a hollow space therein, a first flat electrode member placed in said hollow space and having a first electrode surface, a second flat electrode member placed in said hollow space and having a second electrode surface directed towards said first electrode surface, support means having a first support surface to be brought into contact with said first electrode surface and a second support surface directed towards said second electrode surface for supporting said sample on said second support surface, a.c. voltage providing means for providing an a.c. voltage between said first and said second electrode members to produce said plasma between said first electrode member with said support means and said second electrode member, d.c. voltage producing means for producing a d.c. voltage to electrostatically couple said sample to said support means during production of said plasma and thereby to fixedly attach said sample to said second support surface, the improvement wherein:
said second means comprises:
a first dielectric layer defining said first support surface;
a conductor placed on said first dielectric layer out of contact with said first electrode surface and electrically connected to said d.c. voltage producing means, with said first electrode member electrically insulated fron said d.c. voltage producing means; and

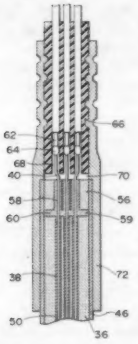
a second dielectric layer covered on said conductor and defining said second support surface to which said sample is to be attached.

4,399,017

GAS SENSOR HAVING LEAD WIRES EXTENDING IN INSULATING AND HERMETICALLY SEALED HOLDER

Yasuhide Inoue; Kenji Ikezawa, and Shinji Kimura, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 11, 1982, Ser. No. 338,539
Claims priority, application Japan, Jan. 19, 1981, 56-5115
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—425 **12 Claims**



1. In a gas sensor having a tubular metal casing, a rod-shaped holder of a ceramic material formed with a plurality of axial through-holes and tightly fitted in the tubular casing, a gas sensing element which operates on an electrochemical principle and which is fixed to a forward end of the rod-shaped holder, a plurality of lead wires which are attached to the gas sensing element and respectively passed through the through-holes in the rod-shaped holder, and a heat-resistant sealant filled into the through-holes in the holder,

the improvement comprising a rod-shaped plug of a ceramic material, said plug being pre-formed with a plurality of axial through-holes and tightly fitted in an end portion of said tubular casing so as to leave a space between the rear end of said holder and the forward end of said plug, said lead wires being respectively passed through said through-holes in said plug across said space, and a hermetic sealant which fills said space between said holder and said plug and said through-holes in said plug, said hermetic sealant comprises a lead glass which is solidified from a molten state within said space and said through-holes in said plug.

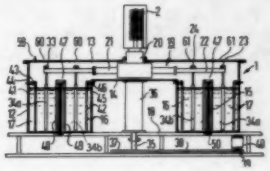
4,399,018

DEVICE FOR ELECTRODEPOSITION OF ALUMINUM

Siegfried Birkle, Hoechstadt; Johann Gehring, Spardorf, and Klaus Stoeger, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 393,199
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133232
Int. Cl.³ C25D *17/06*
U.S. Cl. 204—199 **11 Claims**

1. In a device for electrodepositing of aluminum from an aprotic, oxygen-free and water-free aluminum electrolyte, said device comprising an electroplating tank having an annular vat containing the electrolyte and anode plates, a hood closing the vat from the outside, forming a protective chamber over the electrolyte and having means for charging the chamber with a protective atmosphere, support means for contacting and holding a workpiece holder being disposed in the tank, said support means being rotatable around a vertical axle and having a plurality of fork-shaped brackets extending radially from said axle in a horizontal plane, said brackets having receptacles for receiving horizontal rods of the workpiece holders to suspend the workpiece holder in the vat for rotation in a curved path, said tank including a first lock means for forming a charging lock for introducing workpiece holders into the tank without contaminating the protective atmosphere, and second lock means for removing processed workpiece holders from the



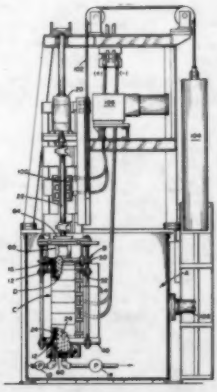
tank without contaminating the protective atmosphere, each of said lock means including a liquid lock and conveyor means for engaging the workpiece holders and passing them through the liquid lock during loading and unloading of the brackets of the support means, the improvements comprising the vat being subdivided into a plurality of annular sub-cells concentrically arranged relative to one another, each bracket having receptacles for each sub-cell and the conveyor means of each of the lock means being designed to convey a workpiece holder for each of said sub-cells simultaneously through the lock means as the brackets of the support means are being loaded and unloaded.

4,399,019

ULTRA-HIGH CURRENT DENSITY ELECTROPLATING CELL

Wayne A. Kruper, Willowick, and Ralph R. Green, Hiram, both of Ohio, assignors to Imperial Clevite Inc., Rolling Meadows, Ill.

Filed Jul. 21, 1981, Ser. No. 285,593
Int. Cl.³ C25D *21/00, 21/04*
U.S. Cl. 204—212 **17 Claims**



1. An electroplating apparatus comprising:

an anode structure containing a source of plating metal;

at least one agitating vane disposed in a plating cavity disposed adjacent the anode structure;

rotating means for rotating the vane through the plating cavity;

an anode electrical conductor for supplying a positive potential to the anode structure;

a locating means for locating workpieces in a fixed physical relationship with the anode structure so as to form said plating cavity; and,

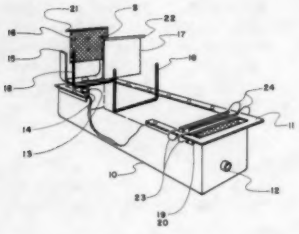
a cathode electrical conductor for supplying a negative potential to the workpieces to be plated.

4,399,020

DEVICE FOR WASTE WATER TREATMENT

Kenneth J. Branchick, Mentor; Irving Malkin, University Hts.; Robert C. Sutter, Painesville; Karel A. Korinek, Mentor, all of Ohio; Mary R. Suchanski, Rochester, N.Y.; Donald M. Knaack, Mentor, and Gary F. Platek, Willoughby Hills, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jul. 24, 1981, Ser. No. 286,551
Int. Cl.³ C25C *7/00, 7/02, 7/04*
U.S. Cl. 204—269 14 Claims



1. A membrane or diaphragm-free electrolytic cell for removal of a metal(s) present as a contaminant(s) in waste water comprising a nonconductive cell box having an upper peripheral flange, anode and cathode bus bars located on said cell box enternally of the cell box, and below said flange, box inlet and outlet means to pass the liquid through electrodes contained in said box, means to space anodes and cathodes contained within said cell box one from the other, a plurality of reticulate cathodes, and means connecting the anodes and cathodes, respectively, to said bus bars and the bus bars to a source of electrical energy whereby the metal contaminant(s) present in such water are deposited on the reticulate cathodes, the spacers being electrically non-conductive and being at least one of peripheral protrusions vertically along the sides of the box and along the bottom of the box, bars affixed to upper surfaces of the anodes and having at least two tongues extending vertically downward along surfaces of the anodes, and snaps affixed to the anodes.

4,399,021

NOVEL ELECTROLYTES FOR ELECTROCHEMICALLY TREATED METAL PLATES

Thomas N. Gillich, Whitehouse Station; John E. Walls, Annandale; Stanley F. Wanat, Scotch Plains, and William J. Rozell, Martinsville, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 188,092, Sep. 26, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,457
Int. Cl.³ C25D *11/10, 11/24*
U.S. Cl. 204—38 A 39 Claims

1. A process for preparing an element comprising;

(a) cleaning a metal article, and

(b) electrolyzing said metal article

made anode using a repetitive cycle pulsed direct current in an aqueous organic electrolytic solution having dissolved therein a water-soluble organic acid or mixture of two or more water-soluble organic acids which, if carboxylic be at least tribasic, under electrolytic conditions sufficient to form an insoluble substantially non-porous metal oxide organic complex, including said organic acid, bonded to the surface of said metal article, wherein said organic acid is present at a concentration of between about 0.05% and about 30% and said electrolysis is conducted at a voltage of at least about 1 volt, at an electrolysis time of between 0.08 minutes and about 5 minutes, and at an electrolyte temperature of between about −2° C. and about 60° C.

4,399,022

REFERENCE ELECTRODE FOR OXYGEN PROBE

Yoshio Nakajima, Hiroshima; Takaharu Moriya; Hajime Nakamura, both of Kure; Koji Omosako, Hiroshima, and Yoshio Tokuta, Kure, all of Japan, assignors to Nisshin Steel Company, Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,815
Claims priority, application Japan, Mar. 26, 1981, 56-44327
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—422 10 Claims

1. In a method of making a reference electrode of a mixture of Cr powder and Cr_2O_3 powder for an oxygen probe, the improvement comprising mixing the Cr powder and Cr_2O_3 powder in a ratio of 97%:3% to 80%:20% by weight, sintering the mixture at a temperature not lower than 1550° C. in an oxygen free atmosphere and pulverizing said sintered mixture.

5. The product made in accordance with the method of claims 1, 2, 3 or 4.

6. In an oxygen probe including a reference electrode formed of a mixture of Cr powder and Cr_2O_3 powder, the improvement comprising said Cr powder and Cr_2O_3 powder present in a ratio of 97%:3% to 80%:20% by weight, said powders being presintered at a temperature not lower than 1550° C. in an oxygen free atmosphere and thereafter pulverized to form said mixture.

4,399,023

PROCESS FOR SIMULTANEOUSLY CRACKING HEAVY HYDROCARBONS INTO LIGHT OILS AND PRODUCING HYDROGEN

Teruo Suzuka; Yukio Inoue; Shirou Aizawa, all of Saitama; Yasushi Ishibashi, Okayama, and Hidetaka Ohse, Tokyo, all of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,540
Claims priority, application Japan, Apr. 16, 1981, 56-57542
Int. Cl.³ C10G *11/04*
U.S. Cl. 208—112 5 Claims

1. A process for simultaneously cracking heavy hydrocarbons to form light oils and producing hydrogen, which comprises

a first step wherein steam and heavy hydrocarbons are simultaneously contacted with a catalyst in a reduced state, containing at least 30% by weight iron in the form of iron oxide, at a temperature of from 500° to 800° C., to produce hydrogen, cracked gases, and cracked light oils, to convert the reduced state catalyst into an oxidized-state catalyst, and to deposit coke on the catalyst, and

a second step wherein the oxidized-state catalyst with the coke deposited thereon is contacted with an oxygen-containing gas insufficient for achieving complete combustion of the coke, at a temperature of from 750° to 950° C., to partially combust the coke on the catalyst, to convert the oxidized-state catalyst into a reduced-state catalyst, and to fix a sulfur compound contained in the coke as iron sulfide with a part of the reduced-state catalyst, wherein the improvement comprises that:

(1) a major portion of the catalyst is recycled between the first step and second step; and

(2) there is provided a third step wherein a part of the cata-

lyst with coke deposited thereon formed in the first step is contacted with an oxygen-containing gas at a temperature of from 600° to 1,000° C. to effect roasting and gasification of iron sulfide in the catalyst, the catalyst after roasting and gasification of iron sulfide being recycled to the first step or the second step, or to both the first and second steps.

4,399,024

METHOD FOR TREATING PETROLEUM HEAVY OIL

Yukimasa Fukui; Heihachiro Mukaida, both of Yotsukaichishi, and Masato Inden, Mieken, all of Japan, assignors to Daikyo Oil Company Ltd., Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,043

Claims priority, application Japan, Nov. 27, 1980, 55-167274

Int. Cl.³ C10G *11/02*

U.S. Cl. 208—131 **10 Claims**

1. A method for producing cracked oil and homogeneous coke of higher fixed carbon with a higher yield by treating petroleum heavy oil selected from the group consisting of atmospheric residue, vacuum residue, thermally-cracked residue, catalytically cracked residue, solvent deasphalted residue, tar sand bitumen and crude shale oil, which comprises subjecting said petroleum heavy oil to heat treatment at a temperature of 400°–550° C. by continuously feeding an additive selected from the group consisting of zinc, nickel, tin, lead, cadmium, tungsten and molybdenum salts of dialkyldithiocarbamic acid, diaryldithiocarbamic acid, alkylxanthogenic acid and arylxanthogenic acid to said petroleum heavy oil.

4,399,025

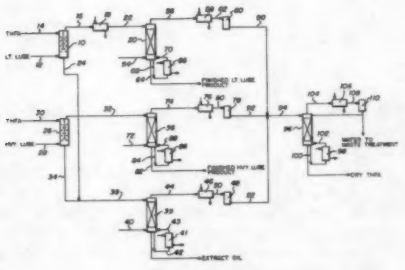
SOLVENT EXTRACTION PROCESS FOR REREFINING USED LUBRICATING OIL

Laird C. Fletcher, and Richard H. O'Blasny, both of Natchitoches, La., assignors to Delta Central Refining, Inc., Natchitoches, La.

Continuation-in-part of Ser. No. 202,015, Oct. 28, 1980, Pat. No. 4,302,325. This application Oct. 8, 1981, Ser. No. 309,576

Int. Cl.³ C10G *21/16*

U.S. Cl. 208—180 **13 Claims**



1. In a process for rerefining used oil containing lubricating oil, where the used oil is rerefined into a heavy lube oil fraction and a light lube oil fraction, the improvement comprising:

(a) mixing the heavy lube oil fraction with an effective amount of tetrahydrofurfuryl alcohol for removing impurities from the heavy lube oil fraction;

(b) separating the heavy lube oil fraction and tetrahydrofurfuryl alcohol mixture into a heavy oil raffinate and a heavy oil tetrahydrofurfuryl alcohol extract;

(c) removing the tetrahydrofurfuryl alcohol from the heavy oil raffinate by mixing the heavy oil raffinate with an effective amount of an antisolvent;

(d) mixing the light lube oil fraction with an effective amount of tetrahydrofurfuryl alcohol for removing impurities from the light lube oil fraction;

(e) separating the light lube oil fraction and tetrahydrofurfuryl alcohol mixture into a light oil raffinate and a light oil tetrahydrofurfuryl alcohol extract; and

(f) removing the tetrahydrofurfuryl alcohol from the light oil raffinate by mixing the light oil raffinate with an effective amount of an antisolvent.

4,399,026

PROCESS FOR HYDROTREATING HEAVY HYDROCARBON OILS, CATALYSTS THEREFOR, AND A METHOD OF PREPARING SUCH CATALYSTS

Yoshimi Shiroto; Takehito Higashi, both of Yokohama, and Takeo Ono, Kawasaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Division of Ser. No. 210,048, Nov. 24, 1980, Pat. No. 4,367,164. This application May 19, 1982, Ser. No. 379,925

Claims priority, application Japan, Nov. 27, 1979, 54-153131

Int. Cl.³ C10G *45/00, 45/04*

U.S. Cl. 208—216 PP **3 Claims**

1. A process for hydrotreating a heavy hydrocarbon oil containing asphaltenes and vanadium, comprising the step of reacting the heavy hydrocarbon oil with hydrogen at a temperature of 350° to 450° C., a pressure of 30 to 250 kg/cm^2 G and a liquid space velocity of 0.1 to 10 Hr^{-1} with a hydrogen to oil ratio of 100 to 2000 Normal liters per liter in the presence of a catalyst, said catalyst comprising:

a carrier which is a calcined composite of a mixture of a clay mineral consisting mainly of magnesium silicate having a double-chain structure and at least one oxide-forming substance selected from the group consisting of compounds of magnesium, boron, silicon, titanium and zirconium and capable of forming an oxide upon calcination; and

at least one catalytic metal component :omposited with said carrier, the metal of said catalytic metal component being selected from the group consisting of the metals belonging to Group VB, VIB, VIII and IB of the Periodic Table;

said catalyst containing between about 5 and about 80% by weight of the oxide formed from said oxide-forming substance and between about 0.1 and about 20% by weight of said catalytic metal component in terms of elemental metal;

said catalyst having a pore volume of between about 0.5 and about 2.0 cc/g, an average pore diameter of between about 100 and about 500 A, and a surface area of between about 40 and about 400 m^2/g.

4,399,027

FLOTATION APPARATUS AND METHOD FOR ACHIEVING FLOTATION IN A CENTRIFUGAL FIELD

Jan D. Miller, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 94,521, Nov. 15, 1979, Pat. No. 4,279,743. This application Aug. 29, 1980, Ser. No. 182,524

Int. Cl.³ B03D *1/02, 1/14*

U.S. Cl. 209—164 **20 Claims**

1. A flotation apparatus for obtaining separation of fine particles in a centrifugal field comprising:

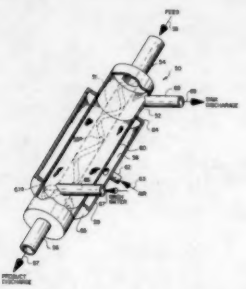
a chamber having a generally circular cross-section and receiving a particulate suspension therein, a substantial portion of the particles in the particulate suspension being fine particles and at least a portion of the particles in the particulate suspension being hydrophobic;

inlet means for introducing a fluid under pressure into the chamber, said fluid being introduced in a generally tangential fashion thereby creating a vortex in the chamber, the vortex forming a centrifugal field;

a porous wall forming at least a portion of the outer wall of the chamber, said porous wall being capable of introducing gas in finely dispersed bubbles into the vortex of said chamber, said gas forming bubble/particle aggregates with the hydrophobic particles in the particulate suspen-

sion and said bubble/particle aggregates being floated towards the core of the chamber and there collecting to form a froth phase within the core of the chamber, thereby achieving separation of said hydrophobic particles by flotation in the centrifugal field;

a gas plenum enclosing the porous wall portion of the outer



wall of the chamber, said gas plenum supplying the gas introduced through the porous wall into the chamber; and

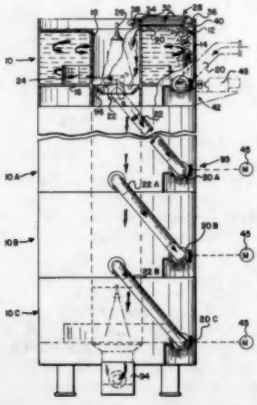
a vortex finder for directing the froth phase out of the chamber, said vortex finder being positioned at an upper end of the chamber and oriented coaxially with the chamber, said vortex finder having a substantially reduced cross-sectional area as compared to the chamber.

4,399,028

FROTH FLOTATION APPARATUS AND METHOD

Gregory D. Kile, Cincinnati; Larry D. Markham, Middletown; Ronald D. Cruea, Franklin, and Derald R. Hatton, Middletown, all of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed Jun. 14, 1982, Ser. No. 388,387
Int. Cl.³ C02F *1/24*
U.S. Cl. 209—164 **19 Claims**



1. An apparatus for elimination of solid particle impurities contained within a liquid by froth flotation comprising:

a vessel having a generally cylindrical side wall defining a flotation cell and including an upstanding foam discharge conduit mounted concentrically within said vessel;

an inlet conduit communicating with said vessel such that fluid flowing through said inlet conduit and into said vessel moves in a vortical fashion within said vessel;

a fluid outlet conduit communicating with said vessel for conveying fluid therefrom;

means for skimming foam from an upper surface of fluid within said vessel and displacing foam to said discharge conduit; and

sparger means for aerating fluid flowing through said inlet conduit including

a porous member rotatably mounted within said inlet conduit; said porous member having an external surface and defining an interior portion,

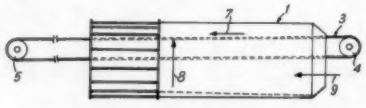
means for conveying gas under pressure to said interior portion of said porous member so that a multiplicity of gas bubbles may be generated as gas flows outwardly through said external surface into fluid flowing through said inlet conduit, and

means for rotating said porous member such that a relative velocity of fluid flowing in said inlet conduit with respect to said external surface may be increased, thereby reducing a size of bubbles generated.

4,399,029

APPARATUS FOR THE CONCENTRATION AND SORTING OF SOLID WASTE MATERIALS ACCORDING TO THEIR SHAPES, THEIR SIZES AND THEIR FLEXIBILITY

Francois H. Clin; Jean-Noël M. Gony, both of Orleans; Francois O. Proust, Olivet; Roger O. Cuvillier, Darvoy, and Philippe J. Larrose, Jouy-le-Potier, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Continuation of Ser. No. 946,276, Sep. 27, 1978, abandoned. This application Mar. 5, 1980, Ser. No. 127,335
Claims priority, application France, Sep. 28, 1977, 77 29135
Int. Cl.³ B07B *1/24*
U.S. Cl. 209—234 **10 Claims**

1. Apparatus for concentrating and sorting solid waste materials, comprising:

a revolving screen, said revolving screen having an intake zone, a central zone and an outlet zone, said central zone comprising a cylindrical member having apertures of a size permitting common glass container objects to pass therethrough and said outlet zone comprising a plurality of parallel bars arranged in a squirrel cage fashion and having a spacing between adjacent bars of the same order of magnitude as the size of said apertures in said central zone, and having a length substantially longer than the size of said apertures;

at least one lifting device disposed in said central zone and extending substantially from near said intake zone to near said outlet zone, said lifting device having a bevelled longitudinal profile decreasing in height towards said intake end;

a shock absorbing lining covering said lifting device at least over a portion thereof near said intake end;

means for rotating said revolving screen; and

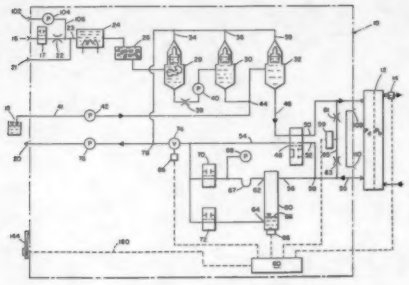
an extractor for collecting flexible products, said extractor comprising an endless conveyor member rotatable between two wheels, at least a portion of said endless conveyor member extending longitudinally through said revolving screen.

4,399,030

RINSING, CLEANING AND DISINFECTING DIALYSATE PREPARATION AND SUPPLY APPARATUS

Dennis J. Hlavinka; Steven H. Johnson, both of Lakewood, and James L. Zook, Denver, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 28, 1981, Ser. No. 258,424
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—91 6 Claims



1. Dialysate preparation and supply apparatus having a water intake port, a concentrated dialysate solution intake connector, dialysate connectors for delivering fresh dialysate to and removing spent dialysate from a dialyzer, and system pumps for pumping liquids through hydraulic circuitry connected to said intake ports, said hydraulic circuitry including said dialysate connectors, said apparatus further comprising a cleaning and/or disinfecting system comprising

a chemical intake port on an accessible exterior surface of said apparatus for connection to sources of different treatment liquids, one at a time,

said port being connected to said hydraulic circuitry,

means for regulating the flow of liquid from said chemical port into said hydraulic circuitry,

means for providing a plurality of keyholes corresponding to said different treatment liquids in said exterior surface at different locations, each said keyhole being adapted to receive a corresponding key on a treatment liquid connector connected to a source of one said treatment liquid, each said keyhole being adapted to not receive any key corresponding to any other said treatment liquid,

means associated with said keyholes for sending electrical signals indicating the presence of a said key in a corresponding said keyhole, and

electrical control means for controlling said pumps and said means for regulating, to pump one of said different treatment liquids for a specific period of time and at a specific flowrate depending on which keyhole has a key in it.

4,399,031

BIOLOGICAL SEWAGE TREATMENT APPARATUS OF THE ROTARY DISC TYPE

Shiro Imano, Toyonaka; Yoshio Sasaki, Ibaraki; Yukio Otsuka, Uji, and Teruo Nisidome, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1981, Ser. No. 280,551
Claims priority, application Japan, Jul. 7, 1980, 55-93001; Mar. 25, 1981, 56-44540
Int. Cl.³ C02F *3/08*
U.S. Cl. 210—150 5 Claims

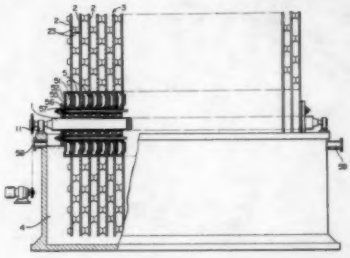
1. A sewage treatment apparatus comprising:

a rotary shaft;

a plurality of holding members fixedly mounted on said rotary shaft for rotation therewith, each of said holding members having a plurality of circumferentially spaced depressed portions at equal distances from the axis of rotation of said shaft; a plurality of rotary plates spaced axially along said shaft and being adapted to be rotated for being partly dipped in sewage in a treating tank;

at least some of said rotary plates having at least one projecting portion on the radially inner end thereof complementary in shape to said depressed portions in said holding members, each of said rotary plates with the projection thereon having said inner end fixedly held between two adjacent holding members with the projecting portion engaged in a corresponding depressed portion of one of the two holding members and any remaining rotary plates having no projections thereon being held between a rotary plate and the other of the two holding members;

said holding members further having projecting portions thereon on the opposite sides thereof from said depressed portions and having flat portions between the depressed



portions, the flat portions on one side being in positions corresponding to depressed portions on the other side, and said rotary plates having depressed portions on the opposite sides thereof from said projecting portions, the last-mentioned projecting portions on said holding members being engaged with said lastmentioned depressed portions on said rotary plates, said rotary plates having no projections thereon being between the sides of said rotary plates on the opposite side from which said projecting portions project and said flat portions on the next adjacent holding members; and

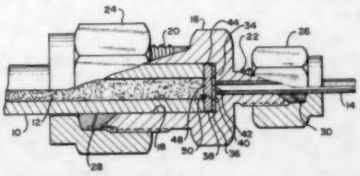
said holding members and rotary plates having small holes therein which are aligned when the holding members and rotary plates are assembled, and the material of said holding members and said rotary plates being melt-bonded to each other around the peripheries of said holes.

4,399,032

CHROMATOGRAPHIC COLUMN TERMINATOR ELEMENT AND ASSEMBLY

Lambert H. Mott, Spring La., Farmington Industrial Park, Farmington, Conn. 06032

Filed Sep. 22, 1982, Ser. No. 421,340
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.2 9 Claims



1. A chromatographic column terminator element for use in a fitting connecting a chromatographic column with an end flow tube comprising an integral dual density porous frit disc including a relatively high density porous rim portion, an

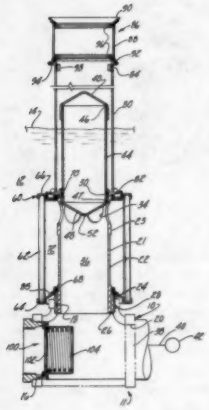
integral relatively low density porous central portion and a porous interface zone integrally joining said rim and central portions, the spaced faces of the rim and central portions of the disc being substantially planar, the surface at said interface zone being recessed relative to said planar faces, the permeability of said central portion relative to said rim portion being at least 3 to 1, the density of the central portion being up to about 80 percent of solid material of the same composition, the density of the rim portion being up to 95 percent of solid material of the same composition.

4,399,033

FLUID FILTERING DEVICE

Borje O. Rosaen, 4031 Thornoaks Dr., Ann Arbor, Mich. 48104, and Dale P. Fosdick, 7000 Austin Rd., Saline, Mich. 48176

Filed Apr. 30, 1981, Ser. No. 259,247
Int. Cl.³ B01D *29/10*
U.S. Cl. 210—236 **13 Claims**



1. A fluid filtering device for use with a fluid reservoir in which a fluid is contained comprising:

a housing defining an interior chamber, said housing having a tubular cylindrical part and a fluid port open to said chamber and adapted for connection with a fluid system,

said housing being adapted to be positioned in said reservoir so that said housing is submerged below the fluid level of the reservoir,

fluid passage means formed through said housing for establishing fluid communication between the fluid in the reservoir and said housing chamber,

an elongated guide member secured at one end to and extending coaxially outwardly from one end of the tubular cylindrical housing part,

a filter assembly slidably insertable over said housing part comprising:

a tubular filter element open at each end,

an elongated extension secured at one end to one end of the filter element,

wherein said filter assembly is insertable over said guide member and over said tubular housing part to a filtering position so that said fluid passage means are positioned intermediate the ends of the fluid element,

means for fluidly sealing the end of the filter element to said housing, and

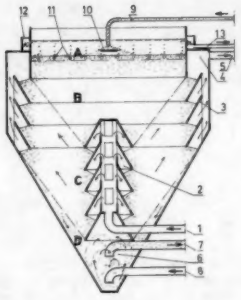
means attached to the opposite end of said extension for closing said fluid passage means upon inverting said filter assembly and inserting the inverted filter assembly over said housing part.

4,399,034

LIQUID FILTERING APPARATUS

Bengt A. K. Möller, 23 Kabäcksvägen, Partille, Sweden S-433 38

PCT No. PCT/SE81/00047, § 371 Date Oct. 26, 1981, § 102(e) Date Oct. 26, 1981, PCT Pub. No. WO81/02393, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 20, 1981, Ser. No. 315,531
Claims priority, application Sweden, Feb. 26, 1980, 8001478
Int. Cl.³ B01D *23/12*
U.S. Cl. 210—268 **2 Claims**



1. A filtering apparatus comprising an upper cylindrical or rectangular portion and a funnel-shaped portion located below and having a continuous supply of clean bed material from above to a movable filter bed, said apparatus comprising means for continuously scavenging the material, inlet means for supplying a fluid to be filtered to the apparatus in the center of the lower portion thereof and along the total height of the filtering zone, outlets arranged at the outer edge of the apparatus and along the total height of the filtering zone, wherein the inlet and outlet means are placed individually in such a manner that there is formed a filtering zone, enclosed by funnel-shaped interfaces, one lower near the bottom casing of the apparatus and one upper from the upper edge of the inlet means to the upper edge of the outlet means, and the fluid to be filtered passes said filtering zone in an overall inclined upward flow.

4,399,035

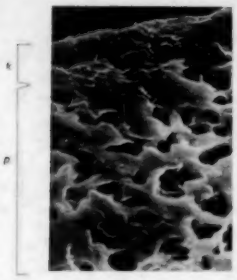
POLYVINYLIDENE FLUORIDE TYPE RESIN HOLLOW FILAMENT MICROFILTER AND PROCESS FOR PRODUCING THE SAME

Takashi Nohmi, Fuji, and Takao Yamada, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP80/00102, § 371 Date Jun. 15, 1981, § 102(e) Date Jun. 15, 1981, PCT Pub. No. WO81/00969, PCT Pub. Date Apr. 16, 1981
PCT Filed May 13, 1980, Ser. No. 276,366
Claims priority, application Japan, Oct. 15, 1079, 54-132739
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—500.2 **4 Claims**

1. A hollow filament microfilter which comprises a polyvinylidene fluoride type resin membrane having a substantially annular shape in cross-section and comprising internal and external surface skin layers and a support layer connected thereto; said skin layers being uniformly porous layers with a average pore diameter ($2r_s$) of 0.05 to 1.0 μm, said support layers being a uniformly porous layer with an average pore diameter ($2r_a$) of 1 to 10 μm, a relationship represented by the formula $r_a/r_s \geqq 4$ being satisfied, said support layer having a plurality of macrovoids extending radially in the substantially annular cross-section of the resin membrane, said macrovoids each having a length of at least 10% and at most 80%, based on

the thickness of the resin membrane, in the radially extending axis direction in said cross-section, said resin membrane having



an average effective pore diameter (2r) of 0.05 to 1.0 μm and a porosity of 60 to 85%.

4,399,036

PROPORTIONING SYSTEM FOR BICARBONATE DIALYSATE

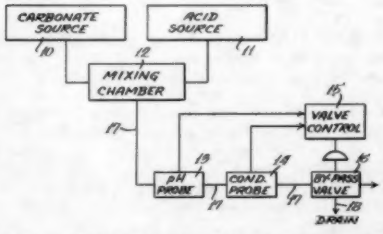
Albert L. Babb, and Belding H. Scribner, both of Seattle, Wash., assignors to Diachem, Inc., Arlington Heights, Ill.

Filed Nov. 23, 1979, Ser. No. 96,865

The portion of the term of this patent subsequent to Apr. 27, 1994, has been disclaimed.

Int. Cl.³ B01D *31/00, 13/00*

U.S. Cl. 210—638 **19 Claims**



14. A method for preparing a bicarbonate dialysate in situ from bacteriorstatic starting solutions which comprises the steps of

providing an aqueous sodium carbonate solution;

providing an aqueous hydrochloric acid-containing solution;

providing a source of physiologically-tolerable water;

diluting said aqueous sodium carbonate solution with said water to produce a diluted sodium carbonate solution that will not cause a precipitate when combined with said aqueous hydrochloric acid containing solution; and

combining said diluted sodium carbonate solution with said hydrochloric acid containing solution in a predetermined volumetric ratio while monitoring hydrogen ion activity and conductivity of the resulting dialysate.

4,399,037

PROCESS FOR WORKING UP WASTE WATER CONTAINING PHOSPHORUS

Herbert Diskowski, Erfstadt; Johannes Krause, Hürth-Hermülheim, and Dietrich Mandelkow, Hürth-Knapsack, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,424

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038336

Int. Cl.³ C02F *1/58*

U.S. Cl. 210—721 **7 Claims**

1. A process for working up phosphorus-containing waste water obtained in the electrothermal production of phosphorus by subjecting it to filtration with the use of a filter aid in a centrifugal filter, which comprises: introducing the waste water with a temperature of at least 46° C. and a pH-value of at least 0.5 but less than 4.0 into the centrifugal filter; introducing filtrate coming from the centrifugal filter into a calming zone and separating it therein with an average period of 10 to 60 minutes into yellow phosphorus and water containing 1 to 30 ppm of phosphorus; treating water overflowing from the calming zone with an oxidant; and neutralizing the waste water so freed from phosphorus with calcium metasilicate.

4,399,038

METHOD FOR DEWATERING THE SLUDGE LAYER OF AN INDUSTRIAL PROCESS TAILINGS POND

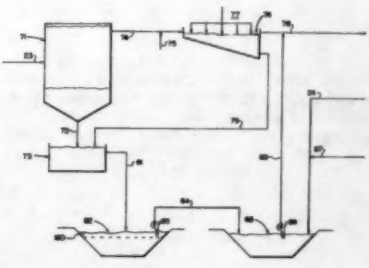
Raymond N. Yong, Beaconsfield, Canada, assignor to Suncor, Inc., Toronto, Canada

Continuation-in-part of Ser. No. 202,103, Oct. 30, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,179

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ C02F *1/54;* C08L *3/02*

U.S. Cl. 210—728 **4 Claims**



1. In a tailings pond system for receiving fines-containing aqueous effluent from an industrial process, the method of obtaining a more thoroughly dewatered sludge layer in the tailings pond by sand surcharging comprising the steps of:

(A) Improving the shear strength and permeability characteristics of the sludge layer by adding an effective dose of at least 37 ppm. of hydrolyzed starch additive to the effluent, which additive is obtained by the aqueous hydrolysis of the starch in the presence of one or more insoluble metal salts formed in situ;

(B) Allowing fines from the effluent to settle into the sludge layer; and

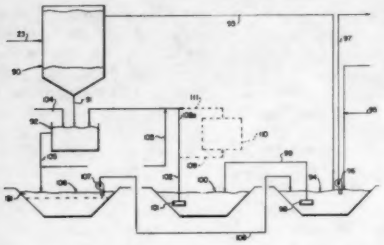
(C) treating the sludge layer with a layer of sand in an effective surcharging amount;

whereby the sand layer functions as a water permeable piston such that water within the sludge layer migrates upwardly through the sand layer.

4,399,039
TREATMENT OF TAILINGS POND SLUDGE

Raymond N. Yong, Beaconsfield, Canada, assignor to Suncor, Inc., Toronto, Canada

Continuation-in-part of Ser. No. 201,888, Oct. 30, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,408
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ C02F *1/54*; C08L *3/02*
U.S. Cl. 210—728 **9 Claims**



1. In a tailings pond system for receiving fines-containing aqueous effluent from an industrial process, the method of obtaining a more thoroughly dewatered sludge layer in the tailings pond by sand surcharging comprising the steps of:

(A) treating the effluent with at least 37 ppm of a hydrolyzed starch additive, which additive is obtained by the aqueous hydrolysis of the starch in the presence of one or more insoluble metal salts formed in situ;

(B) mixing the treated effluent with an effective surcharging amount of sand; and

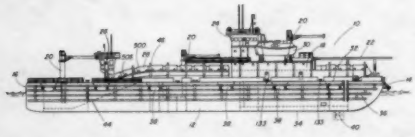
(C) discharging the treated effluent/sand mixture into the tailings pond;

whereby the treated effluent/sand mixture settles into a sludge layer from which water migrates upwardly.

4,399,040
OPEN SEA SKIMMER BARGE

William M. Ayers, Duncan, Okla.; Ashok K. Maheshwary, and Peter J. Young, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 161,088, Jun. 19, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,511
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—749 **26 Claims**



1. A method of skimming oil and the like from the surface of a body of water utilizing a vessel having a hull having a bow, a stern having an elongate substantially horizontal slot extending across a portion thereof, side walls, a bottom, a deck, a spill suction tunnel, tunnel pump means, a collection tank, collection tank flap means located in the bottom of the collection tank and extensible into the spill suction tunnel, collection tank pump means, secondary oil recovery means, tertiary oil recovery means and oil boom means thereon, said method comprising the steps of:

releasably deploying the oil boom means on said vessel in said body of water;

releasably securing oil boom means to the stern of said vessel;

towing said vessel by the stern thereof into said oil and the like by the oil boom means;

confining said oil and the like between the oil boom means thereby collecting said oil and the like adjacent the elongate substantially horizontal slot in the stern of said vessel;

flowing said oil and the like and a portion of the water of said body of water underlying said oil and the like into the spill suction tunnel;

flowing said oil and the like and an amount of water from said body of water which was flowed into the suction tunnel into the collection tank;

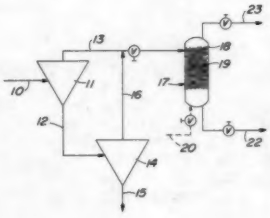
separating said oil and the like from the water in the collection tank utilizing the secondary oil recovery means; and

separating said oil and the like from substantially any remaining water contained therein utilizing the tertiary oil recovery means after the separation of said oil and the like from the water in the collection tank utilizing the secondary oil recovery means.

4,399,041
PROCESS FOR PARTICULATE REMOVAL FROM COAL LIQUIDS

Gerald C. Rappe, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed May 26, 1981, Ser. No. 267,141
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—787 **11 Claims**



1. The method of removing suspended solid particulates contained in a liquefied coal product which consists essentially of the steps of:

(a) subjecting said liquefied coal product as feed to a hydroclone treatment, thereby separating the said to obtain an under flow portion of substantially higher solids concentration than that of said feed and an overflow portion of lower solids concentration than that of said feed; said overflow portion containing at least the major part of the particles from said feed of the size range up to about 10 microns;

(b) introducing said overflow portion into the electrostatic field of an electrofilter to deposit contained solids in said filter; and

(c) discharging the solids-free liquid filtrate from said electrofilter.

4,399,042
FILTER DEVICES AND METHODS

Forrest B. Stannard, Ft. Lauderdale, and Edward J. Highstreet, Coral Springs, both of Fla., assignors to The Dehydro Corporation, Charlotte, N.C.

Filed Oct. 19, 1981, Ser. No. 312,620
Int. Cl.³ B01D *23/02, 23/24*
U.S. Cl. 210—791 **17 Claims**

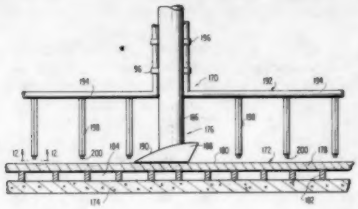
12. A method of filtering influent material prone to form a fluid flow resistant filter cake which comprises:

providing a flat, horizontal, rigid filter bed,

flowing influent onto the top surface of said filter bed and causing a filter cake to form on said surface by removal of filtrate from said influent through said filter bed,

passing a blade over said top surface of said filter bed to lift portions of said filter cake away from said filter bed,

simultaneously with said lifting of filter cake, applying a vacuum through a porous surface in said blade to the lifted



portions of filter cake to effect removal of further filtrate therefrom,

continuing said blade passing and vacuum applying until a mass of incoherent particles of filtered material is produced, and

removing said mass of incoherent particles from said filter bed.

4,399,043
FABRIC SOFTENER

Karl-Heinz Keil, Offenbach am Main; Adolf May, Hofheim am Taunus, and Hans-Walter Bücking, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

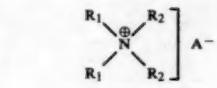
Continuation of Ser. No. 170,587, Jul. 21, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,300

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930111

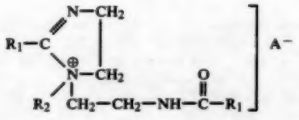
Int. Cl.³ D06M *13/18, 13/32, 13/46*

U.S. Cl. 252—8.7 **3 Claims**

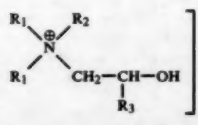
1. Fabric softeners in the form of an aqueous solution or dispersion, which contain from 3 to 15% by weight of one or several compounds of formulae I to III



I

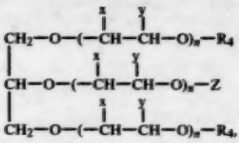


II



III

in which R_1 is alkyl or alkenyl each with 10 to 30 carbon atoms, R_2 is alkyl of from 1 to 4 carbon atoms, R_3 is methyl or hydrogen, and A is an anion, from 0.1 to 3%by weight of a glycerol ether derivative of formula IV



IV

in which R_4 is alkyl or alkenyl each with 4 to 20 carbon atoms, cyclohexyl or aryl optionally substituted by alkyl groups, x and y are hydrogen or methyl, but are not methyl at the same time, n is a number of from 0 to 20, Z is a group of formula $—(CH_2)_m COOMe$, $—SO_3Me$ or $—PO_3Me_2$, m is an integer of from 0 to 3, and Me is an alkali metal or ammonium ion, as well as optionally further auxiliaries and additives.

4,399,044
TEXTILE SOFTENING COMPOSITION

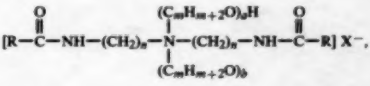
James M. Richmond, Naperville, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 1, 1982, Ser. No. 344,685

Int. Cl.³ D06M *13/40, 13/46*

U.S. Cl. 252—8.8 **27 Claims**

1. An aqueous composition for imparting softness to textile materials, said composition comprising an ethoxylated amido amine quaternary salt corresponding to the following structural formula:



wherein R is selected from the group of hydrocarbon radicals containing from about 6 to about 22 carbon atoms, said radicals being either cyclic or straight- or branched-chain aliphatics, or aromatics, a and b are integers whose sum is between 2 and 20, inclusive, m is an integer between 2 and 4, inclusive, n is an integer between 2 and 6, inclusive, and X is a dihydroborate or organoborate anion.

4,399,045
CONCENTRATED FABRIC SOFTENING COMPOSITIONS

Michael E. Burns, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

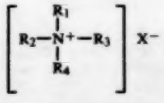
Continuation-in-part of Ser. No. 207,862, Nov. 18, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 318,772

Int. Cl.³ D06M *13/46*

U.S. Cl. 252—8.75 **19 Claims**

1. A concentrated homogeneous aqueous fabric softener composition which is pourable at 40° F., the said composition comprising:

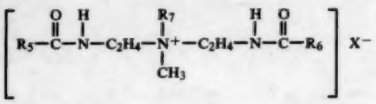
A. from about 2% to about 11% of a quaternary ammonium salt having the formula



wherein R_1 and R_2 can be the same or different from each other and are selected from the group consisting of C_{14} to C_{20} alkyl and alkenyl groups, R_3 and R_4 can be the same or different and are selected from the group consisting of C_1 to C_3 alkyl and $—(C_nH_{2n}O)_xH$ groups wherein n is 2 or 3,

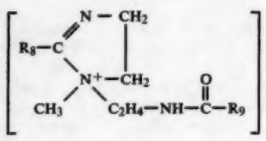
x is from about 1 to about 3, and wherein X^- is an anion selected from halide, methylsulfate and ethylsulfate;

B. from about 2% to about 14% of a di(2-amidoethyl) methyl quaternary ammonium salt having the formula



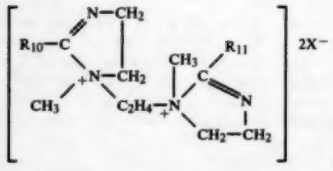
wherein R_5 and R_6 are the same or different from each other and are selected from the group consisting of C_{14} to C_{20} alkyl and alkenyl groups, wherein R_7 is selected from the group consisting of H, methyl, ethyl and $(C_nH_{2n}O)_xH$ wherein n is 2 or 3 and x is from 1 to about 5 and wherein X^- is selected from halide, ethylsulfate and methylsulfate;

C. from about 2% to about 13% of an imidazolinium quaternary salt having the formulas



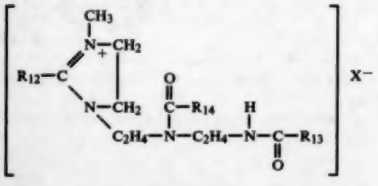
(1)

wherein R_8 and R_9 are the same or different from each other and are selected from the group consisting of C_{14} to C_{20} alkyl and alkenyl groups, wherein X^- is halide, ethylsulfate or methylsulfate;



(2)

wherein R_{10} and R_{11} can be the same or different from each other and are selected from the group consisting of C_{14} to C_{20} alkyl and alkenyl and X^- is halide, methylsulfate or ethylsulfate; and



(3)

wherein R_{12}, R_{13}, and R_{14} are the same or different from each other and are selected from the group consisting of C_{14} to C_{20} alkyl or alkenyl, wherein X^- is halide, methylsulfate or ethylsulfate;

D. from about 0.05% to 0.6% of an inorganic water-soluble ionizable salt; and

E. water;

wherein the total amount of Components A+B+C is from about 15% to about 22.5%, wherein there is unsaturation present on at least one of Components A, B or C such that the cationic active system, components A+B+C, has an Iodine Value of at least about 4.2.

4,399,046

FLAME-RETARDANT BUILDING MATERIALS AND METHOD FOR MAKING SAME

Tatsuro Okamura, 4-1, Kusae, Ube-shi, Yamaguchi-ken, Japan, and Hideki Irifune, Ube, Japan, assignors to Tatsuro Okamura, Ube and Yoshida Kogyo K. K., Tokyo, both of, Japan

Filed Jan. 21, 1982, Ser. No. 341,322

Claims priority, application Japan, Feb. 23, 1981, 56-26398

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.³ C04B *43/12*; E04B *1/94, 1/74*

U.S. Cl. 252—62 **9 Claims**

1. A building material which comprises a disintegrated organic fibrous material and aluminum hydroxide in a gel-like form admixed with a flame retardant agent.

4,399,047

COMPOSITION FOR USE IN A MAGNETICALLY FLUIDIZED BED

Robert L. Seiver, and Martin O. Gernand, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 218,086, Dec. 19, 1980, Pat. No. 4,367,153, which is a continuation-in-part of Ser. No. 943,553, Sep. 18, 1978, abandoned. This application Sep. 22, 1982, Ser. No. 421,040

Int. Cl.³ B01J *21/04, 35/02*

U.S. Cl. 252—62.55 **6 Claims**

1. As a composition of matter, particulate material which can be formed into a magnetically stabilized fluidized bed to provide high magnetization at a low applied field which comprises particles of average size ranging from about 10 μm to about 4,000 μm containing a non-ferromagnetic refractory, porous inorganic oxide component composited with a plurality of elongated ferromagnetic components, each ferromagnetic component being multidomain, having dimensions of at least 1 μm in all directions, elongated in two directions, and having a length:dimaeter (L/D) ratio of at least 2 and not more than 313, said ferromagnetic components being present in the composite particles as inclusions within said non-ferromagnetic refractory porous inorganic oxide component, and randomly oriented and constituting at least 0.5%, but not more than $\pi/2(L/D+1)$, of the total volume of each particle, where L/D is the average ratio of the longest dimension of the ferromagnetic components relative to the shortest dimension, wherein a catalytically effective amount of a catalytically active metal is dispersed on the surface of the composite particles, and the composite particles are catalytically active.

4,399,048

HIGH BULK DENSITY PARTICULATE HEAVY DUTY LAUNDRY DETERGENT

William J. Gangwisch, New Brunswick; Virgil J. Richter, West Orange; Harold E. Wixon, New Brunswick, and Joseph B. Wraga, Bogota, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 839,780, Oct. 6, 1977, Pat. No. 4,264,464. This application Nov. 26, 1980, Ser. No. 210,863

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ C11D *3/08, 3/10, 3/12, 11/02*

U.S. Cl. 252—91 **10 Claims**

1. A free-flowing, phosphate free, particulate, heavy duty, laundry detergent having a bulk density greater than 0.6 g/milliliter comprising non-ionic detergent-containing beads produced by

(a) preparing a crutcher mix by adding sufficient water soluble sodium silicate to an aqueous slurry of sodium

carbonate, sodium bicarbonate and a detergent building ion exchanging aluminosilicate zeolite to form a gel, said zeolite having an average ultimate particle diameter of about 15 microns or less,

(b) shearing the gel to reduce the viscosity thereof,

(c) adding additional sodium silicate to the sheared gel, such that the crutcher mix contains from about 2 to about 15% by weight of the silicate,

(d) spray drying the crutcher mix to form beads having a water content of about 2 to about 12% and the proportions of zeolite, sodium carbonate and sodium bicarbonate in the spray dried beads are in the range of 1:0.3–1.6:0-.2–2.0, on an anhydrous basis,

(e) mixing with said beads from 0.2 to 1.6 parts of nonionic detergent in liquid form so that such detergent is absorbed into the beads.

4,399,049

DETERGENT ADDITIVE COMPOSITIONS

Ian Gray, Gosforth, and Richard G. Harris, Morpeth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 29, 1982, Ser. No. 362,812

Claims priority, application United Kingdom, Apr. 8, 1981, 8111080; Oct. 23, 1981, 8132014

Int. Cl.³ C11D *1/66, 3/48, 11/00, 17/06*

U.S. Cl. 252—91 **17 Claims**

1. A detergent additive composition in the form of an extrudate comprising by weight thereof:

(a) from about 84% to about 90% of particulate, infusible solids having a particle size distribution such that at least about 50% thereof passes a 250 micrometer screen and comprising storage-sensitive detergent additive material, and

(b) from about 10% to about 16% of ethoxylated nonionic surfactant melting in the range from about 20° C. to about 60° C.,

the composition being prepared by mixing the particulate infusible solids and ethoxylated nonionic surfactant in liquid form to form a substantially homogeneous friable mass, and mechanically extruding the friable mass by means of a screw with radial discharge through an apertured screen to form extrudate in the form of elongate particles having an average lateral dimension in the range from about 0.5 millimeters to about 2 millimeters, and an average longitudinal dimension in the range from about 1 to about 6 millimeters.

4,399,050

BLEACH COMPOSITION

John Bentham; Jacqueline A. Coates, and David L. Connell, all of Leeds, England, assignors to Sandoz Products Limited, Leeds

Filed May 13, 1981, Ser. No. 262,887

Claims priority, application United Kingdom, May 13, 1980, 8015803

Int. Cl.³ C11D *3/395, 7/54*

U.S. Cl. 252—95 **22 Claims**

1. A stable thickened aqueous bleach composition comprising

(a) an alkali metal hypochlorite, in an amount sufficient to provide 1 to 14% by weight of available chlorine,

(b) one or more carboxylated surfactants of formula I

$$RO\text{-}[\text{-}CH_2CH_2O]_n R_1\text{—}COO^{\ominus}A^{\oplus} \qquad I$$

in which

R is a straight chain $C_{6\text{-}20}$alkyl, phenyl, a straight or branched chain $C_{7\text{-}30}$alkaryl or a straight or branched chain $C_{7\text{-}30}$aralkyl, unsubstituted or substituted with substituents unreactive to hypochlorite,

R_1 is $C_{1\text{-}4}$alkylene,

$A^{\oplus}$ is hydrogen ion, an alkali metal cation, or an equivalently charged amount of an alkaline earth metal cation and n is 0.5 to 45,

in a total amount of 1.4 to 3.1% by weight of the composition and

(c) from 4 to 25% of sodium chloride by weight of the total bleach composition, with the proviso that n is a number such that the molar percentage (E) of ethylene oxide in the group $RO\text{—}(CH_2CH_2O]_n$, or the average E in the case of a mixture of surfactants of formula I, is from 20% to 80%, and the value of n is given by the formula

$$n = \frac{EM}{44\,(100 - E)},$$

where M is the molecular weight of the group RO—.

4,399,051

METHOD FOR REGENERATION OF RHODIUM-CONTAINING CATALYST

Georgy L. Rabinovich, ulitsa Antonova-Ovseenko, 19, korpus 2, kv. 14; Zoya P. Lukina, Manezhny pereulok, 2, kv. 2; Kira L. Volkova, ulitsa Antonova-Ovseenko, 19, korpus 2, kv. 4, all of Leningrad, and Viktor N. Mozhaiko, ulitsa Nevskaya, 3, kv. 3, Otradnoe Leningradskoi oblasti, all of U.S.S.R.

PCT No. PCT/SU80/00073, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO80/02809, PCT Pub. Date Dec. 24, 1980

PCT Filed May 5, 1980, Ser. No. 237,150

Claims priority, application U.S.S.R., Jun. 15, 1979, 2770904

Int. Cl.³ B01J *23/96, 21/04;* **C07C** *4/18, 15/06*

U.S. Cl. 252—415 **8 Claims**

1. A method for regenerating a sulfur poisoned rhodium-containing catalyst used for dealkylating alkyl benzenes with steam or hydrogen, consisting essentially of the steps of: burning out carbon deposits with an oxygen-containing gas; chlorinating the catalyst, in a flow of gas selected from the group consisting of hydrogen, an inert gas, or a mixture of an inert gas with oxygen and moisture, with a chlorinating compound selected from the group consisting of chlorine or a chloroorganic compound; and

treating the catalyst at a temperature of from 20° to 650° C., and a pressure of from 1 to 50 atm, for 0.5 to 48 hours with a nitrogen-containing compound selected from the group consisting of an aqueous ammonia solution, gaseous ammonia, or a nitrogen-containing compound which decomposes under the treatment conditions to yield ammonia;

wherein the treatment with ammonia in the gaseous phase is conducted in the presence of at least one component selected from the group consisting of: steam, water, hydrogen, a nitrogen-oxygen mixture, and an oxygen-inert gas mixture.

2. A method according to claim 1, wherein the catalyst treatment with ammonia is carried out at any stage of the regeneration.

3. A method according to claim 1, wherein the ammonia treatment is carried out in the gaseous phase at a temperature of from 150° to 650° C. and a pressure of from 5 to 15 atm.

4,399,052

ACTIVATED CARBONACEOUS HONEYCOMB BODY AND PRODUCTION METHOD THEREOF

Morihiko Sugino, Kamakura, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 17, 1981, Ser. No. 302,984

Claims priority, application Japan, Dec. 22, 1980, 55-181692

Int. Cl.³ B01J *20/20;* **C01B** *31/10, 31/08;* **B01J** *21/18*

U.S. Cl. 252—421 **6 Claims**

1. A method for producing an activated carbonaceous honeycomb body which comprises:

extruding a mixed and kneaded mass containing a thermosetting resin, a water-soluble thermosetting resinous adhesive as a binder and an extrusion aid at an extrusion pressure of 90 kg/cm² or higher into a honeycomb structure to obtain a green honeycomb body, the composition of the mixed

and kneaded mass having been adjusted so as to produce a linear extrusion velocity of at least 5 mm/sec;

after drying and solidifying the green honeycomb body, preheating the thus-dried and solidified green honeycomb body in a non-oxidizing atmosphere at a heating rate of 30° C./hr or lower to a temperature in the range of from 500° to 1,100° C. and holding it within the preheating temperature range until the hydrogen content of the resulting C-matrix thereof has been lowered to 2% or less; and

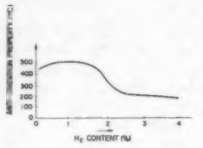
heating the thus-preheated honeycomb body in an activating atmosphere to a temperature in the range of from 600° to 1,000° C. and holding the same within the heating temperature range until the ratio of the total thickness of resulting activated carbon layers to that of the remaining glassy carbon layer in the thickness direction of each wall of the honeycomb body has reached a value not greater than 30.

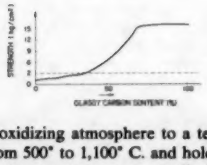
4. A method for producing an activated carbonaceous honeycomb body which comprises:

extruding a mixed and kneaded mass containing a phenol resin into a honeycomb structure at an extrusion pressure of 90 kg/cm^2 or higher and at a linear extrusion velocity of 5 mm/sec or faster to obtain a green honeycomb body;

allowing the green honeycomb body to stand for at least 5 hours;

after drying and solidifying the green honeycomb body, preheating the thus-dried and solidified green honeycomb





body in a non-oxidizing atmosphere to a temperature in the range of from 500° to 1,100° C. and holding it within the preheating temperature range until the hydrogen content of the resulting C-matrix thereof has been lowered to 2% or less;

cooling the thus-preheated honeycomb body at a cooling rate of 50° C./hr or lower to a temperature 100° C. below the final holding temperature and then at a cooling rate of 100° C./hr or lower; and

heating again the thus-cooled honeycomb body in an activating atmosphere to a temperature in the range of from 600° to 1,000° C. and holding the same within the heating temperature range until the ratio of the total thickness of resulting activated carbon layers to that of the remaining glassy carbon layer in the thickness direction of each wall of the honeycomb body has reached a value not greater than 30.

5. An activated carbonaceous honeycomb body made of glassy carbon and activated carbon, wherein the ratio of the total thickness of activated carbon layers to that of a glassy carbon layer in the thickness direction of each wall of the honeycomb body is 30 or less, the specific surface area of each activated carbon layer ranges from 300 to 2,000 m^2/g, the porosity of the glassy carbon layer is at least 0.2 cc/g and the hydrogen content in the C-matrix of the honeycomb body is not greater than 2%.

4,399,053

HIGH EFFICIENCY CATALYST CONTAINING TITANIUM, ZIRCONIUM AND ZINC FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin; Donald F. Birkelbach, Angleton, and Kirby Lowery, Jr., Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 24, 1980, Ser. No. 219,690

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.^{3} C08F *4/64*

U.S. Cl. 252—429 B **7 Claims**

1. A catalytically active reaction product of

(A) a trivalent or tetravalent titanium compound selected from the group consisting of

(1) α-$TiCl_3$,

(2) γ-$TiCl_3$,

(3) trivalent titanium complexes represented by the empirical formula $TiZ_3(L)_x$ wherein Z is a halide, L is an electron donating compound selected from water, alcohol, ether, ketone, amine or olefin and x is a whole number from 1 to 6;

(4) tetravalent titanium compounds represented by the empirical formula $TiX_n(OR)_{4-n}$ wherein X is a halogen, R is a hydrocarbyl group having from 1 to about 20 carbon atoms and n has a value from zero to 4; and

(5) mixtures thereof;

(B) a zirconium compound represented by the empirical formula $Zr(OR)_xX_z$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, each X is a halogen atom, x and z independently have values from zero to 4 and the value of x plus z is 4;

(C) a divalent zinc compound represented by the empirical formula R'_2Zn wherein each R' is independently a hydrocarbyl group having from 1 to about 20 carbon atoms;

(D) an organomagnesium compound or a complex of an organomagnesium compound and an organometallic compound represented by the empirical formulas $MgR''_2.xMR''_y$ or MgR''_2 wherein R'' is hydrocarbyl or a hydrocarbyloxy group having from 1 to about 20 carbon atoms, M is aluminum, zinc, boron, silicon, tin or phosphorous and x has a value of from zero to about 10 and y has a value equal to the valence of M; and

(E) a halide source selected from the group consisting of

(1) an active non-metallic halide, said non-metallic halide corresponding to the empirical formula R'X wherein R' is hydrogen or an organic group at least as active as sec-butyl and X is halogen,

(2) a metallic halide corresponding to the empirical formula $M'R^3_{y-a}X_a$ wherein M' is a metal of Group IIB, IIIB, or IVB of Mendeleev's Periodic Table of the Elements, R^3 is a hydrocarbyl or hydrocarbyloxy group, X is halogen, y is a number corresponding to valence of M' and a is a number from 1 to y, and

(3) mixtures thereof;

provided that the proportions of the foregoing components of said catalytically active reaction product are such that the atomic ratio of Mg:Zr is from about 1:1 to about 100:1; the atomic ratio of Al:Zr is from about 0.1:1 to about 100:1; the atomic ratio of Zr:Ti is from about 0.1:1 to about 50:1; the atomic ratio of Zn:Ti is from about 0.1:1 to about 200:1; the atomic ratio of excess X:Al is from about 0.0005:1 to about 10:1; and further provided that when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, there is also present an aluminum compound represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the total value of y' plus y'' being three.

4,399,054

CATALYST COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Mario Ferraris, Novara; Francesco Rosati, Milan; Sandro Parodi, Oleggio; Enzo Giannetti, Novara; Giuseppe Motroni, Galliate, and Enrico Albizzati, Arona, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 68,395, Aug. 21, 1979, abandoned. This application Jan. 21, 1981, Ser. No. 226,837

Claims priority, application Italy, Aug. 22, 1978, 26908 A/78

Int. Cl.³ C08F 4/02, 4/64

U.S. Cl. 252—429 B 6 Claims

1. Catalyst components for the polymerization of olefins, which comprise the reaction product of a Ti compound selected from the group consisting of Ti tetrahalides, Ti haloalcoholates and Ti halophenolates with a Mg halide, said catalyst components being in the form of spherical particles having an average diameter comprised within the range of from 1 to 100 micron, a surface area comprised between 300 and 500 m^2/g and a porosity comprised between 0.3 and 0.4 cm^3/g, and being capable of forming, by reaction with Al-alkyl compounds, catalysts which, when used in a standard test for the polymerization of propylene, yield polymers in the form of spherical particles having a flowability lower than 16 seconds, determined according to ASTM 1895-79 (A), and a bulk density higher than 0.4 g/cm^3.

4,399,055

CARRIER OF CATALYST AND CATALYST COMPONENT COMPOSED OF THE CARRIER, FOR POLYMERIZATION OF OLEFINS, AS WELL AS PROCESSES FOR PRODUCTION THEREOF

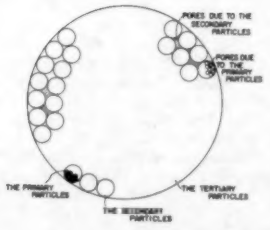
Mitsuyuki Matsuura, Kameyama, and Takashi Fujita, Yakkaichi, both of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Apr. 22, 1982, Ser. No. 370,666

Claims priority, application Japan, May 1, 1981, 56-66229; Jul. 3, 1981, 56-103205; Jan. 23, 1982, 57-9070

Int. Cl.³ C08F 4/02, 4/64

U.S. Cl. 252—429 B 15 Claims


PORES DUE TO THE SECONDARY PARTICLES
PORES DUE TO THE TERTIARY PARTICLES
THE PRIMARY PARTICLES
THE TERTIARY PARTICLES
THE SECONDARY PARTICLES

1. A carrier of a catalyst for polymerization of olefins which is a catalyst carrier of solid particles produced from a magnesium halide, characterized in that the carrier is composed of tertiary particles each constituted by a large number of fine secondary particles, each of said secondary particles is constituted by a large number of very fine primary particles included therein, and the carrier composed of said tertiary particles has:

(a) a specific area in a range of 0.1 to 10 m^2/g,

(b) a void volume formed by pores of not more than 10,000 A of not more than 0.5 ml/g,

(c) a ratio of the average diameter of the tertiary particles to that of the secondary particles in a range of 50 to 200, and

(d) a ratio of the specific surface area of the carrier to that of a sphere having a diameter corresponding to the particle diameter of the tertiary particles in a range of 1 to 10.

6. A catalyst component for polymerization of olefins which is prepared by contacting at least one component of three components (D), (E) and (F) with the catalyst carrier of any of claims 1 through 5,

the component (D) being a liquid titanium compound, which must contain a halogen in the case where this component is used alone or in combination with the component (F),

the component (E) being a silicon halide compound, and

the component (F) being a polymeric silicone compound having a structural unit represented by the formula

wherein R° is a hydrocarbon residue.

4,399,056

ORGANO ZIRCONIUM-CHROMIUM MIXTURES, CATALYST PREPARED THEREFROM AND POLYMERIZATION OF OLEFINS THEREWITH

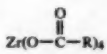
Randall S. Shipley, Alvin, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1981, Ser. No. 269,221

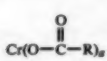
Int. Cl.³ C08F 4/64

U.S. Cl. 252—431 C 9 Claims

1. As a composition of matter, the product resulting from mixing (1) at least one zirconium compound represented by the empirical formula



with (2) at least one organic soluble chromium compound represented by the empirical formula



in a mole ratio of component (2) to component (1) of from about 0.05:1 to about 10:1 and wherein each R is independently a hydrocarbon group having from 1 to about 20 carbon atoms and a has a value equal to the valence of Cr.

4,399,057

CATALYST AND SUPPORT, THEIR METHODS OF PREPARATION, AND PROCESSES EMPLOYING SAME

Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 17, 1981, Ser. No. 274,499

Int. Cl.³ B01J 27/14, 21/02, 20/00, 21/00

U.S. Cl. 252—435 52 Claims

1. A method for preparing an improved catalyst support from a composite comprising two or more inorganic oxides, which method comprises forming said composite into a shaped catalyst support material having a selected shape and at least 0.8 cc/gm of its pore volume in pores having diameters of 0 nm (0 Å) to 120 nm (1,200 Å) and at least 0.1 cc/gm of its pore volume in pores having diameters of 120 nm (1,200 Å) to 5,000 nm (50,000 Å) and heating said shaped catalyst support material in the presence of steam at sufficient elevated temperature, steam pressure, and time period to increase the average pore diameter of said shaped catalyst support material in the absence of any appreciable reduction in pore volume so as to provide a catalyst support material having an average pore diameter of at least 18 nm (180 Å) and a surface area below 200 m^2/gm.

4,399,058
IMPREGNATING SOLUTION FOR HYDROGENATION CATALYST MANUFACTURE AND PRODUCTION THEREOF

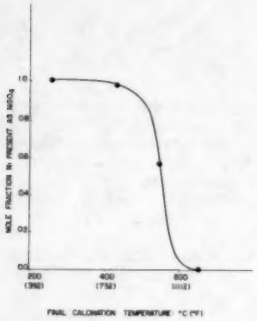
John J. Stanulonis, Pittsburgh; Joseph A. Tabacek, New Kensington, and Roger F. Vogel, Butler, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 72,237, Sep. 4, 1979, abandoned. This application Mar. 6, 1981, Ser. No. 241,018

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ B01J *23/64, 27/24*

U.S. Cl. 252—438 8 Claims



1. A process for the formation of an aqueous, alkaline impregnating solution for the one-step incipient wetness impregnation of nickel and molybdenum onto a catalyst support, which process comprises admixing two separate solutions

(A) an aqueous ammoniacal solution of Ni^{++} supplied by nickel sulfate, and

(B) an aqueous ammoniacal solution of Mo^{+VI}, the final weight of nickel per unit volume of impregnation solution is higher than that attainable by adding the same amount of nickel sulfate as is present in solution (A) directly to said solution (B) and then adding sufficient ammonium hydroxide to form a clear solution under the same conditions.

4,399,059
ZEOLITE CATALYSTS MODIFIED WITH GROUP IIIA METAL

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 303,287, Sep. 17, 1981, Pat. No. 4,374,294, which is a continuation-in-part of Ser. No. 212,067, Dec. 2, 1980, Pat. No. 4,302,622. This application Sep. 29, 1982, Ser. No. 426,408

Claims priority, application European Pat. Off., Feb. 19, 1981, 81300683.0

Int. Cl.³ B01J *29/28*

U.S. Cl. 252—455 Z 15 Claims

1. A catalyst composition suitable for para-selective conversion of substituted aromatic compounds, said composition comprising a modified crystalline zeolite catalyst component characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said composition further having incorporated thereon at least 0.5 weight percent of at least one element of Group IIIA of the Periodic Chart, said element being in its oxide form when combined with said catalyst composition.

8. The composition of claim 1 which further has incorporated thereon at least 0.25 weight percent of the element phosphorus in addition to said Group IIIA element, said phosphorus and said Group IIIA metal both being in the oxide form when combined with said catalyst composition.

4,399,060
SEMICONDUCTIVE ELASTOMERIC COMPOSITION

Gary L. Glass, Stow, Ohio, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Feb. 10, 1981, Ser. No. 233,220

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 10 Claims

1. Semiconductive elastomeric composition comprising:

(a) 100 parts by weight of a copolymer of ethylene, 40–62 weight percent of an alkyl acrylate and 0.5–10 weight percent of a monoalkyl ester of 1,4-butenedioic acid;

(b) 1 to 10 parts by weight of a peroxide curing agent;

(c) 10 to 150 parts by weight of an electrically conductive carbon black; and

(d) 0 to 100 parts by weight of a copolymer of ethylene with propylene and/or an unconjugated diene.

4,399,061
PREPARATION OF VIDEO DISC MOLDING COMPOSITION

Paulo Sickert, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,165

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 3 Claims

1. In a process for preparing a conductive vinyl chloride resin based molding composition containing at least about 12 percent by weight of conductive carbon black particles wherein certain components of said composition, including said resin and carbon black, are mixed in the dry state in a mixing vessel, said mixing having the tendency to deposit powder onto the inner surface of said vessel, the improvement comprising adding to said dry components an amount of isopropyl alcohol sufficient to substantially reduce the amount of powder deposited on said surface during mixing, but not exceeding about 2 percent by weight of said composition.

4,399,062
BRANCHED CHAIN OLEFINIC ALCOHOLS, THIOLS, ESTERS AND ETHERS, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PREPARING SAME AND INTERMEDIATES THEREFOR

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

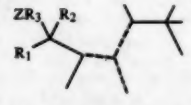
Continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Nov. 19, 1981, Ser. No. 322,841

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ A61K *7/46;* C11B *9/00*

U.S. Cl. 252—522 R 6 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume base or a cologne base an aroma augmenting or enhancing quantity of at least one branched chain olefinic chalcogen derivative having the formula:



wherein Z represents oxygen or sulfur; wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds; wherein R_1 represents C_1–C_4 alkyl; R_2 represents C_1–C_4 alkyl; R_3 represents hydrogen, C_1–C_3 lower alkyl or C_1–C_3 lower acyl.

4,399,063

PRINS REACTION PRODUCTS OF DIISOBUTYLENE, DERIVATIVES THEREOF, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

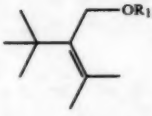
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 280,683, Jul. 6, 1981. This application Jun. 24, 1982, Ser. No. 391,595

Int. Cl.³ C11B 9/00

U.S. Cl. 252—522 R 3 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume composition or cologne base an aroma augmenting or enhancing quantity of a compound defined according to the structure:



wherein R_{11} represents hydrogen or acetyl.

4,399,064

ANTI-TRACKING HIGH VOLTAGE INSULATING MATERIALS

Richard J. Penneck, Lechlade, England, assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 434,126, Jan. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 81,558, Oct. 16, 1970, abandoned. This application Jan. 3, 1980, Ser. No. 109,249

Claims priority, application United Kingdom, Oct. 17, 1969, 51119/69

Int. Cl.³ C08G 47/00; H01B 3/00; C04B 35/10

U.S. Cl. 523—173 40 Claims

1. Solid electrically insulating material suitable for high voltage applications which comprises one or more polymers suitable for electrical insulation use and from about 20% to about 75% by weight of an anti-tracking filler system comprising: (a) a hydrate of alumina having a specific surface area of at least about 2 m2/g, measured by the BET method, and (b) at least about 0.5% by weight of the total weight of the electrically insulating material of a compound selected from the group consisting of oxides, mixed oxides, and mixtures of oxides, wherein said compound contains at least one element selected from the group consisting of transition series elements, lanthanide series elements, and nontransuranic actinide series elements, said electrically insulating material having an initial tracking voltage of at least about 2.5 kilovolts when tested according to ASTM-D 2303-68 Liquid Contaminant Inclined Plane test.

2. An electrically insulating material as claimed in claim 1 wherein said element is selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, rhenium, iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, thorium, and uranium.

3. An electrically insulating material as claimed in claim 1, wherein the hydrate of alumina is the trihydrate, $Al_2O_3.3H_2O$.

4,399,065

D-PHENYLALANYL-L-PROLYL-L-ARGININE ALDEHYDE SULFATE AND PROCESS FOR THE PREPARATION THEREOF

Sandor Bajusz; Erzsebet Szell nee Hasenöhrl; Eva Barabas, and Daniel Bagdy, all of Budapest, Hungary, assignors to Patentbureau Danubia, Budapest, Hungary

Filed Jan. 5, 1982, Ser. No. 337,288

Claims priority, application Hungary, Jan. 13, 1981, 70/81

Int. Cl.³ C07C 103/52

U.S. Cl. 260—112.5 R 2 Claims

1. D-Phenylalanyl-L-prolyl-L-arginine aldehyde sulfate highly stable in aqueous solution.

4,399,066

NOVEL PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Osamu Nakaguchi, Toyonaka; Satoshi Okada, Takatsuki, and Masashi Hashimoto, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

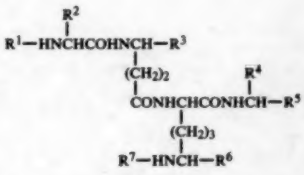
Filed Jan. 20, 1982, Ser. No. 341,056

Claims priority, application United Kingdom, Jan. 29, 1981, 8102687

Int. Cl.³ C07C 103/52; A61K 37/02

U.S. Cl. 260—112.5 R 3 Claims

1. A compound of the following formula or its pharmaceutically acceptable salt:



wherein

R^1 is hydrogen or acyl,

wherein acyl is selected from the group consisting of alkanoyl and aralkanoyl either of which may be substituted with halogen, hydroxy, protected hydroxy, carboxy, or amino,

R^2 is lower alkyl,

R^3 is carboxy or protected carboxy,

R^4 is hydroxy(lower) alkyl,

R^5 is carboxy or protected carboxy,

R^6 is carboxy or protected carboxy, and

R^7 is hydrogen or an amino protective group.

4,399,067

DERIVATIVES OF A-21978C CYCLIC PEPTIDES

Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

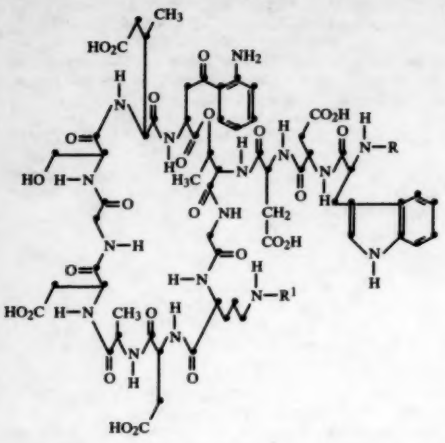
Filed May 21, 1982, Ser. No. 380,498

Int. Cl.³ C07C 103/52

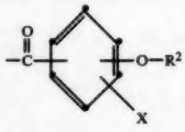
U.S. Cl. 260—112.5 R 8 Claims

1. An A-21978C cyclic peptide derivative of the formula:

1



wherein R is a substituted benzoyl group of the formula



R^2 is C_8–C_{15} alkyl; X is hydrogen, chloro, bromo, iodo, nitro, C_1–C_3 alkyl, hydroxy, C_1–C_3 alkoxy, or C_1–C_3 alkylthio; and R^1 is hydrogen or an amino-protecting group; and the salts thereof.

4,399,068

CONCENTRATED, AQUEOUS SOLUTIONS OF SALTS OF ACETOACETYLAMINO-ARYLSULPHONIC ACIDS AND METHOD OF FORMING CONCENTRATED SOLUTIONS OF AZO DYESTUFFS THEREFROM

Erich Krämer, Berg.-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,602

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702584

Int. Cl.³ C09B *29/036, 29/039, 29/33, 44/02*

U.S. Cl. 260—158 **4 Claims**

1. Process for the preparation of a concentrated dyestuff solution substantially free from foreign ions comprising

(a) reacting a compound of the formula

$$H_2N—R—(SO_3H)_m$$

wherein

R is benzene or naphthalene unsubstituted or substituted with fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulphonylamino, phenylazo, naphthylazo, or phenylazo or naphthlazo substituted by methyl, methoxy, chloride, or nitro or is benzene substituted with carboxylcarbonylamino; and

m is 1, 2 or 3;

with diketene in an aqueous or aqueous-organic solvent while maintaining a reaction pH > 3 by adding an amine of the formula

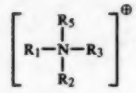
wherein

R_1 is hydroxyalkyl, alkoxyalkyl or $—(C_2H_4O)_n—R_4$;

R_2 and R_3 are alkyl, hydroxyalkyl, alkoxyalkyl or $—(C_2H_4O)_n—R_4$,

or, together with the N atom, are pyrrolidine, morpholine, or piperazine;

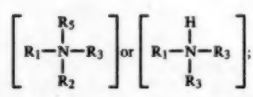
or by adding an ammonium hydroxide containing a cation of the formula



wherein R_1, R_2 and R_3 are as defined above and R_5 is R_2 or R_3, to form a concentrated salt solution substantially free from foreign ions of the coupling component of the formula

$$_m(Me^{\oplus}O_3S)—R—NHCO—CH_2—CO—CH_3$$

wherein Me is



(b) reacting the resultant concentrated salt solution with a diazotized amine of the formula

$$A—NH_2$$

wherein A is the radical of a diazo component to form a concentrated solution of the corresponding azo dyestuff.

4,399,069

PROCESS FOR AN ENANTIOSELECTIVE SYNTHESIS OF OPTICALLY ACTIVE 14-OXO-E-HOMO-EBURNANE DERIVATIVES

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Janos Sapi; Janos Kreidl; Maria Farkas nee Kirjak; Andras Nemes, and Laszlo Cibula, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

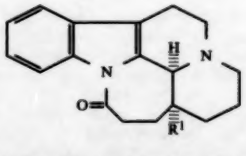
Filed Oct. 16, 1981, Ser. No. 312,128

Claims priority, application Hungary, Oct. 12, 1980, 2525

Int. Cl.³ C07D *471/14, 471/22*

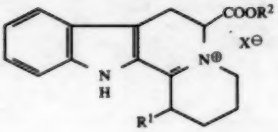
U.S. Cl. 260—239.3 P **25 Claims**

1. A process for an enantioselective synthesis of an optically active 14-oxo-E-homo-eburnane compound of the formula (Ia)



(Ia)

wherein R^1 is alkyl having from 1 to 4 carbon atoms, which comprises reacting an optically active 6-alkoxycarbonyl-hexahydroindoloquinolizinium salt of the formula (II)

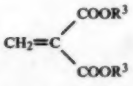


(II)

wherein

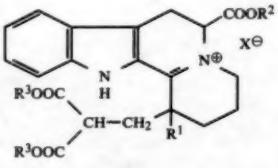
R^2 is alkyl having from 1 to 4 carbon atoms,

X is perchlorate, with a methylenemalonic acid diester derivative of the formula (III)



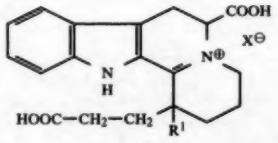
(III)

wherein R^3 is alkyl having from 1 to 4 carbon atoms, in the presence of a basic catalyst, subjecting the resulting optically active 6-alkoxycarbonyl-hexahydroindoloquinolizinium-1-yl-methylene malonate of the formula (IV)



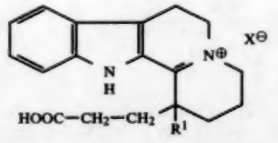
(IV)

to acid and a subsequent alkaline hydrolysis, then subjecting the resulting active hexahydroindoloquinoliziumdicarboxylic acid compound of the formula (V)



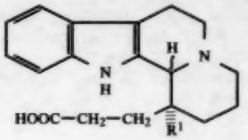
(V)

to selective decarboxylation, saturating the resulting optically active hexahydroindoloquinoliziniummonocarboxylic acid of the formula (VI),



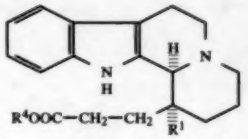
(VI)

and cyclizing the resulting optically active octahydroindoloquinolizinemonocarboxylic acid of the formula (VII)



(VII)

with or without isolation, or subjecting it to esterification after isolation, or esterifying an optically active hexahydroindoloquinoliziniummonocarboxylic acid of the formula (VI) and then saturating same, and finally subjecting a compound of the formula (VIII)



(VIII)

wherein R^4 is alkyl having from 1 to 4 carbon atoms, obtained by esterification and a subsequent saturation or saturation and a subsequent esterification, to ring closure.

4,399,070

STABLE SALT-FREE PARTIALLY CHELATED METAL COMPOSITIONS AND METHOD OF PREPARATION

David A. Wilson, Richwood, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 14, 1981, Ser. No. 301,629

Int. Cl.³ C07F 3/06

U.S. Cl. 260—429.9 **6 Claims**

1. A stable, salt-free partially chelated aqueous zinc solution which contains zinc ions, the zinc chelate of an aminopolycarboxylic acid and ammonium hydroxide, at least part of said zinc ions being unchelated.

4,399,071

METHOD FOR MAKING DIARYLIODONIUM SALTS

James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,433

Int. Cl.³ C07F 9/68, 9/92, 9/00

U.S. Cl. 260—440 **8 Claims**

1. A method for making a diaryliodonium salt which comprises,

(1) incrementally adding a peracid to a $C_{(1-13)}$ iodo aryl compound to provide a mixture of from about 1–3 moles of peracid per mole of iodo aryl compound,

(2) combining the mixture of (1) with a mixture of a $C_{(1-13)}$ organic sulfonic acid and a $C_{(6-13)}$ aryl organic compound selected from a substituted and unsubstituted aromatic hydrocarbon to produce a mixture having about 1 mole of the $C_{(1-13)}$ organic sulfonic acid and about 1 mole of the aryl organic compound per mole of the iodo aryl compound,

(3) allowing the ingredients of (2) to react to produce a diaryliodonium organosulfonic acid salt,

(4) recovering the diaryliodonium organic sulfonic acid salt from (3),

(5) effecting a metathesis between the diaryliodonium organic acid salt of (4) and a polyfluoro metal or metalloid salt of the formula,

XMF_d,

(6) recovering the resulting diaryliodonium polyfluoro metalloid salt from the mixture of (5), and

(7) washing the recovered diaryliodonium polyfluoro metalloid salt of (6) to effect removal therefrom of the by-product organic sulfonic acid metal salt,

where M is a metal or metalloid, X is an ion of an element selected from hydrogen, alkali metals and alkaline earth metals, and d is an integer equal to 4–6 inclusive.

4,399,072

N-PHENYL-N-METHYLUREA DERIVATIVES

Takemoto Ichiki, Takarazuka; Ryo Yoshida, Kawanishi; Seizo Sumida, Nishinomiya, and Kamoshita Katsuzo, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

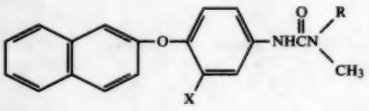
Division of Ser. No. 967,018, Dec. 6, 1978, Pat. No. 4,280,835. This application Jan. 15, 1981, Ser. No. 225,248

Claims priority, application Japan, Dec. 13, 1977, 52-150377

Int. Cl.³ C07C *83/10, 103/30*

U.S. Cl. 260—453 RW **3 Claims**

1. A compound of the formula:



wherein X is a hydrogen atom, a halogen atom or a trifluoromethyl group and R is a methyl group or a methoxy group.

4,399,073

PREPARATION OF TERTIARY ALKYL ISOCYANATES

Frederic C. Schaefer, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 26, 1982, Ser. No. 371,913

Int. Cl.³ C07C *118/00*

U.S. Cl. 260—453 P **13 Claims**

1. In a process for production of a tertiary alkyl isocyanate by reacting the corresponding tertiary alkyl halide with an alkali metal cyanate in a ratio between 1:0.8 and 1:4 of equivalents of halide to moles of cyanate at a temperature of between 0° C. and 100° C. in a reaction mixture further comprising an aprotic organic solvent and an amount of catalyst effective to promote the reactiion of said alkyl halide and said alkali metal cyanate, the improvement in which said reaction mixture further comprises water in an amount of 0.02% to 0.2% based on the weight of said reaction mixture.

4,399,074

PREPARATION OF TERTIARY ALKYL ISOCYANATES

Frederic C. Schaefer, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 26, 1982, Ser. No. 371,915

Int. Cl.³ C07C *118/00*

U.S. Cl. 260—453 P **8 Claims**

1. A process for production of a tertiary alkyl isocyanate from the corresponding tertiary alkyl halide which comprises:

a. preparing a complex of a zinc salt of an acid selected from mineral acids and carboxylic acids and pyridine in a 1:2 mole ratio,

b. thereafter reacting said zinc-pyridine complex with an alkali metal cyanate to form a zinc-pyridine-cyanate complex containing 2 equivalents of cyanate anion per atom of zinc, and

c. reacting said zinc-pyridine-cyanate complex with said tertiary alkyl halide in an aprotic solvent at a temperature of from 0° C. to 100° C. to form said tertiary alkyl isocyanate.

4,399,075

PROCESS FOR PRODUCING CHLORINATED PHENOXYTOLUENE DERIVATIVES

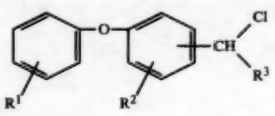
Zenichi Yoshida, Kyoto; Susumu Kato, Sakai; Takuya Fujiki, Kyoto, and Yasuhiro Amemiya, Hirakata, all of Japan, assignors to Asahi Chemical Company, Limited, Japan

Filed Jun. 25, 1981, Ser. No. 277,347

Int. Cl.³ C07C *41/22*

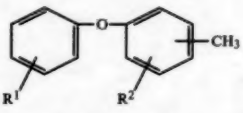
U.S. Cl. 260—465 F **14 Claims**

1. A process for producing in high yield and high selectivity a chlorinated phenoxytoluene derivative represented by the formula



(1)

wherein R^1 and R_2 are the same or different and are each hydrogen, halogen, cyano, nitro, alkyl, alkoxyl, alkoxycarbonyl, halogenoalkyl, acyl, acyloxy, aryl, aralkyl or aralkyloxy, R^3 is hydrogen or chlorine, which comprises chlorinating at a temperature of 0° to 150° C. a phenoxytoluene derivative represented by the formula



(2)

wherein R^1 and R^2 are same as above, with chlorine in an amount that provides said chlorinated phenoxytoluene derivative, in the presence of about 0.001 to 50 wt. % based on said phenoxytoluene derivative of at least one compound selected from the group consisting of nitrogen-containing compound, sulfur-containing compound, phosphorus-containing compound and oxygen-containing compound which is capable of forming a charge-transfer complex with chlorine, chlorine radical or organic halogen compound, together with about 0.001 to 20 wt. % based on said phenoxytoluene derivative of radical initiator and about 1 to 20 times the weight of said phenoxytoluene derivative of an organic halogen compound.

4,399,076

1,1-DISUBSTITUTED 2-VINYL- AND 2-ETHYLCYCLOPROPANES

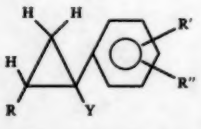
Richard G. Fayter, Jr., Fairfield, and Allen L. Hall, Amelia, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,669

Int. Cl.³ C07C *121/75, 87/28, 125/063, 127/17*

U.S. Cl. 260—465 F **8 Claims**

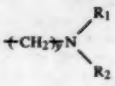
1. A compound of the formula



where R is an ethyl or vinyl group, R′ and R″ are hydrogen, halogen, nitro or a hydrocarbon radical having from 1 to 20 carbon atoms and Y is

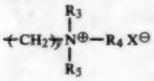
(a) nitrile;

(b) an amine of the formula



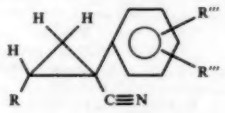
where y is an integer from 0 to 6 and R_1 and R_2 are hydrogen, alkyl, hydroxyalkyl, aryl, carboalkoxy or carbamyl; or

(c) a quaternary amine of the formula



where y is an integer from 0 to 6, R_3, R_4 and R_5 are alkyl, aryl, or hydroxyalkyl and X is halide, hydroxide, sulfate, nitrate, alkylsulfate, alkylphosphate or fluoroborate.

4. A compound of the formula



where R is ethyl or vinyl and R‴ is hydrogen, chloro, bromo, fluoro, nitro, C_{1-4} alkyl, C_{1-4} hydroxyalkyl or C_{1-4} alkoxyl.

4,399,077

CERTAIN POLYOXY PERFLUORINATED SURFACE ACTIVE OLIGOMERS

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

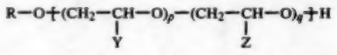
Filed Jun. 4, 1980, Ser. No. 156,398

Claims priority, application France, Jun. 7, 1979, 79 14639

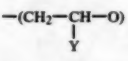
Int. Cl.[3] **C07C** *87/22, 87/30, 91/26, 141/04*

U.S. Cl. 260—501.13 **8 Claims**

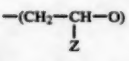
1. A perfluorinated surface-active oligomer having the formula



wherein R is joined to the



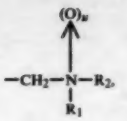
group or to the



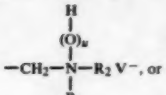
group, and wherein R represents (i) a straight or branched chain hydrofluorocarbon having 2–18 carbon atoms, (ii) a hydrocarbon radical having 2–18 carbon atoms, or (iii) a mixture of (i) and (ii),

Y represents a fluorocarbon or hydrofluorocarbon radical having 6 to 13 carbon atoms,

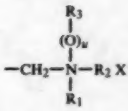
Z represents



(a)



(b)



(c)

wherein R_1 and R_2 each independently represent alkyl or hydroxyalkyl having 1–2 carbon atoms, R_3 represents alkyl, monohydroxyalkyl or dihydroxyalkyl having 1–3 carbon atoms, u represents 0 or 1, V^- represents a hydrochloric, hydrobromic, sulfuric, phosphoric, acetic, lactic or tartaric acid radical, X^- represents a chloride, bromide, methylsulphate, methanesulphonate or para-toluene sulphonate anion, and p and q, each independently, represent an integral or decimal number ranging from 0.5 to 30.

4,399,078

HYDROCARBON SOLVENT SOLUTIONS OF COMPLEXES OF N-BUTYLLITHIUM AND ETHYLLITHIUM

Robert C. Morrison, Gastonia, N.C., assignor to Lithium Corporation of America, Bessemer City, N.C.

Continuation-in-part of Ser. No. 357,843, Mar. 15, 1982, abandoned. This application Jul. 6, 1982, Ser. No. 395,272

Int. Cl.[3] **C07F** *1/02*

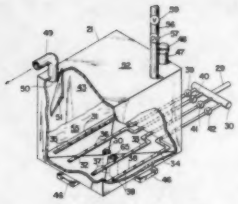
U.S. Cl. 260—665 R **27 Claims**

1. In a method of preparing liquid hydrocarbon solutions of complexes of n-butyllithium and ethyllithium in which the ratio of the n-butyllithium to the ethyllithium, on a mole basis, is from about 1:9 to about 9:1, the steps which comprise providing a stirred dispersion of finely divided lithium metal containing a small proportion of sodium metal in a liquid with which the lithium metal is essentially unreactive, discontinuing the stirring and allowing the lithium metal to rise to the top of the mixture, separating out the unreactive liquid and replacing it with a liquid hydrocarbon solvent, gradually adding to said lithium metal dispersion, under conditions of vigorous agitation and in an inert gas atmosphere, a relatively homogeneous mixture of (a) n-butyl chloride or bromide and (b) ethyl chloride or ethyl bromide in predetermined relative proportions to provide the aforesaid solutions containing the complexes in their above-stated mole ratios of the n-butyllithium and ethyllithium, and continuing the reaction at a temperature in the approximate range of about 20° to about 35°, under conditions of stirring, until said reaction is at least substantially completed, filtering and washing the reaction muds with a liquid hydrocarbon solvent for said complexes to produce a final clear hydrocarbon solution of said complexes.

4,399,079
METHOD AND APPARATUS FOR GENERATING VAPOR OF A VOLATILE LIQUID FUEL AND OPERATING AN INTERNAL COMBUSTION ENGINE THEREWITH

Charles L. Lowe, Laurel, Miss., assignor to Jacob H. Grayson, Hattiesburg, Miss.

Filed Apr. 4, 1979, Ser. No. 26,594
Int. Cl.³ B01F 3/04
U.S. Cl. 261—36 A 24 Claims



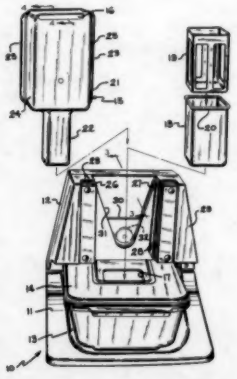
1. In apparatus for generating vapor of a volatile liquid fuel for an internal combustion engine and operating an internal combustion engine therewith, the said apparatus including vessel means containing the said fuel vapor thus generated in the interior thereof and an internal combustion engine, the internal combustion engine having a plurality of cylinders for combustion of the fuel vapor and air-fuel vapor supply means for supplying a combustible admixture of air and fuel vapor to the cylinders in response to reduced pressure within the cylinders, the said air-fuel vapor supply means including an intake manifold means in communication with the interior of the cylinders, air-fuel vapor conduit means in communication with the interior of the said intake manifold means and throttle means in the said air-fuel vapor conduit means upstream of the said manifold means whereby suction is applied to the said air-fuel vapor conduit means and a combustible admixture of air and fuel vapor is supplied to the cylinders as needed for operating the internal combustion engine at varying speeds controlled by the said throttle means,

the improvement which comprises air-fuel vapor conduit means having first and second end portions, the said first end portion being in communication with the interior of the intake manifold means and the said second end portion being in communication with an upper portion of the interior of the said vessel means containing the fuel vapor whereby when the internal combustion engine is operating the said air-fuel vapor supply means supplies fuel vapor to the cylinders and suction is applied to the said air-fuel vapor conduit means which causes fuel vapor to be withdrawn from an upper portion of the said vessel means by suction and passed through the air-fuel vapor conduit means to the said intake manifold means, the interior of the said vessel means being maintained under a pressure no greater than the ambient atmospheric pressure and the contents thereof being unheated by an extraneous source of heat, means for vaporizing volatile normally liquid fuel for an internal combustion engine to thereby produce additional fuel vapor in the said vessel means, the said vaporizing means being effective for vaporizing unheated volatile liquid fuel at a pressure not exceeding the ambient atmospheric pressure and with the resulting fuel vapor phase as initially generated being free of suspended liquid fuel droplets whereby the fuel vapor contained in the interior of the said vessel means is unheated by an extraneous source of heat, is under a pressure no greater than the ambient atmospheric pressure and is free of suspended finely divided liquid fuel, the said vaporizing means including means for applying pressure to the said liquid fuel and means for substantially continuously introducing an excess of the resultant pressurized liquid fuel into a lower portion of the said vessel means under vigorous conditions of agitation to thereby vaporize a portion of the liquid fuel, the said pressurized liquid fuel being introduced into the said vessel means at a rate sufficiently in excess of the vaporization rate whereby an agitated body of a freshly introduced liquid fuel phase is present in the lower portion of the said vessel means and a fuel vapor phase is present above the resultant liquid fuel phase in the upper portion of the interior of the said vessel means, the said means for introducing the pressurized liquid fuel including conduit means positioned adjacent the bottom of the said lower portion of the vessel means having a plurality of spaced openings formed therein through which fresh pressurized liquid fuel is introduced into the said lower portion of the vessel means, the said means for introducing pressurized liquid fuel also including means for controlling the rate at which the pressurized liquid fuel is introduced through the said plurality of openings and thereby controlling the rate at which the liquid fuel is vaporized, the said conduit means and plurality of openings therein being arranged in spaced relationship across the said lower portion of the vessel means and being effective to introduce the pressurized liquid fuel into the said lower portion of the vessel means substantially uniformly across the surface area thereof and under vigorous agitation conditions without forming a substantial amount of finely subdivided liquid fuel that becomes suspended in the fuel vapor phase, the fuel vapor phase in the said upper portion of the interior of the vessel means being free of liquid fuel in the form of finely subdivided particles when withdrawn via the said air-fuel vapor conduit means, and means for withdrawing liquid fuel from the liquid fuel phase in the lower portion of the said vessel means at a rate to maintain a desired liquid level while substantially continuously introducing the said pressurized liquid fuel.

4,399,080
HUMIDIFIER APPARATUS

Robert P. Swank, Mansfield, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Sep. 14, 1981, Ser. No. 301,828
Int. Cl.³ B01F 3/04
U.S. Cl. 261—80 13 Claims



5. A humidifier comprising reservoir means for holding a body of liquid, an enclosed first housing, a motor mounted within said first housing, a second housing, means releasably attaching said second housing to said first housing, said second housing projecting downwardly into such body of liquid in said reservoir means when said second housing is attached to said first housing, an aerosol generator mounted in said second housing and including means for generating an aerosol from

reservoir liquid and means for circulating air from outside said second housing through said second housing in contact with such aerosol, and means for driving said aerosol generating means from said motor when said second housing is attached to said first housing.

4,399,081

APPARATUS FOR AERATING LIQUIDS

Kenneth G. Mabb, Peterborough, England, assignor to Sodastream Limited, Peterborough, England

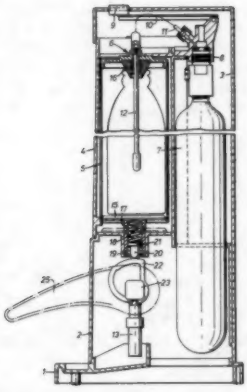
PCT No. PCT/GB81/00001, § 371 Date Aug. 19, 1981, § 102(e) Date Aug. 19, 1981, PCT Pub. No. WO81/01945, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 2, 1981, Ser. No. 296,423

Claims priority, application United Kingdom, Jan. 15, 1980, 8001355

Int. Cl.³ B01F 3/04

U.S. Cl. 261—121 R 5 Claims



1. In a portable apparatus for aerating liquids comprising a casing, an aerating head mounted to the casing and including a nozzle and seal means surrounding the nozzle, gas supply means connected to the aerating head and operable to supply gas to said nozzle, a platform for supporting and contacting a bottle having an open mouth and containing lquid to be aerated, means for raising the platform to lift the mouth of said bottle into sealing engagement with said seal means, said platform raising means including rotary cam means supported rotatably on a cam shaft in the casing, an operating member located oustide the frame means and coupled to the cam means for rotating the cam means manually, and a cam follower connected to the platform and in cooperating engagement with the cam means, the improvement which comprises a tubular stem slidable within said casing and fixed to the platform and extending downwardly therefrom having upper and lower abutment surfaces spaced apart and facing towards each other, a coil spring compressed within said tubular stem between the abutment surfaces, the cam follower being slidably and resiliently mounted to said tubular stem and including a flange received within said tubular stem between the lower abutment surface and the adjacent end of the spring, the coil spring being precompressed to a predetermined value between the upper abutment surface and the cam follower to urge the flange against the lower abutment surface, and the spring being adapted to become further compressed when the bottle mouth engages the seal means with a predetermined force and said flange moves out of engagement with the lower abutment surface on raising the platform, whereby to ensure a tight seal between the bottle mouth and the seal means and to prevent bending of the cam shaft.

4,399,082

BLOWDOWN DEVICE FOR STEAM POWER PLANTS

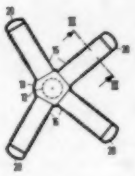
Manfred Becker, Bad Homburg; Klaus Melchior, Frankfurt am Main, both of Fed. Rep. of Germany, and Leonhard Siegers, Bethesda, Md., assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 26,521, Apr. 3, 1979, abandoned, which is a continuation of Ser. No. 845,369, Oct. 25, 1977, abandoned, which is a continuation of Ser. No. 655,692, Feb. 6, 1976, abandoned. This application Jan. 27, 1981, Ser. No. 228,963

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1975, 2505848

Int. Cl.³ B01F 3/04

U.S. Cl. 261—124 8 Claims



1. In a steam power plant, in combination, a water chamber and a blowdown device comprising at least one substantially straight tube having a longitudinal axis and disposed substantially horizontally in a volume of water received in said water chamber, said tube having a substantially circular cross section and being formed with a multiplicity of holes having a substantially uniform diameter for introducing, into the water received in said water chamber, steam that is flowing in the tube, all of said holes being located within a limited area of the peripheral surface of said tube, said area extending in longitudinal direction of said tube over a major part of the length thereof, said holes being disposed mutually aligned on respective diametrically opposite sides of said tube in circumferential rows spaced one from another a distance equal to at least 2.5 times the diameter of the holes, said circumferential rows respectively spanning a circular arc segment of less than 90°, the holes of said circumferential rows being substantially equal in number above and below a horizontal plane passing through said longitudinal axis of said tube, the spacing between mutually adjacent rows of said holes being greater than the spacing between mutually adjacent holes in the respective rows of said holes on each of said opposite sides of said tube, and said limited area of the peripheral surface of said tube being located at sides of the tube whereat each of the holes at the middle of the respective circumferential rows of holes has an axis extending in horizontal direction.

4,399,083

METHOD AND APPARATUS FOR MAKING A COMPOSITE CARBON MATERIAL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Sep. 16, 1981, Ser. No. 302,794

Claims priority, application Japan, Sep. 25, 1980, 55-133607

Int. Cl.³ B06B 3/00

U.S. Cl. 264—23 16 Claims

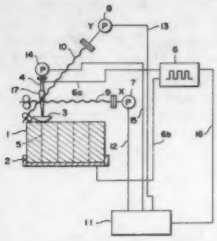
1. A method of making a composite carbon material, comprising the steps of:

(a) forming a precompact of granular carbons of different origins;

(b) heating a localized region of said carbon precompact at a temperature between 1800° and 3500° C. while pressurizing said localized region at a pressure between 500 kg/cm² and 5000 kg/cm² in at least one direction; and

(c) successively displacing, in a scanning manner, from one portion to another in said carbon precompact, said region

subjected to simultaneous heating and pressurization in step (b) so as to controlledly crystallize said carbon pre-



compact and to control the formation of crystalline vacancies therein.

4,399,084

PROCESS FOR PRODUCING A FIBROUS ASSEMBLY

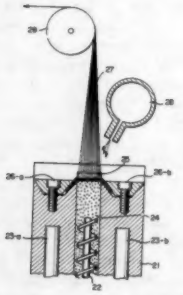
Yasuhiko Sagawa; Susumu Norota; Tsutomu Kiriyama; Shingo Emi; Tadasi Imoto, and Tetsuo Yamauchi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 17, 1981, Ser. No. 293,269

Claims priority, application Japan, Aug. 18, 1980, 55-112637; Oct. 2, 1980, 55-136699; Mar. 31, 1981, 56-46344; May 12, 1981, 56-70238

Int. Cl.³ H05B *1/00*

U.S. Cl. 264—27 16 Claims



1. A process for producing a fibrous assembly, which comprises extruding a melt of a fiber-forming polymer through a mesh spinneret, said spinneret including many closely arranged small openings and having an opening ratio (α), represented by the following formula, of at least about 10%

$$\alpha = \frac{V_a - V_f}{V_a} \times 100$$

V_a (cm^3) is the total apparent volume of the spinneret which is taken within one square centimeter of the mesh portion of the spinneret, and V_f (cm^3) is the total volume of partitioning members defining the small openings which is taken within one square centimeter of the mesh portion of the spinneret; said extrusion being carried out while generating Joule heat in the partitioning members of the spinneret and cooling the vicinity of the extrusion surface of the spinneret by supplying a cooling fluid, whereby the melt is stably converted into fine streams by the partitioning members; and taking up and solidifying the fine streams.

4,399,085

PROCESS OF PRODUCING FIBRE-REINFORCED SHAPED ARTICLES

Geoffrey R. Belbin, Welwyn, and Frederic N. Cogswell, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 20, 1982, Ser. No. 341,185

Claims priority, application United Kingdom, Jan. 21, 1981, 8101822

Int. Cl.³ B29D *27/00*; B29H *7/20*

U.S. Cl. 264—41 5 Claims

1. A process of producing a fibre reinforced shaped article comprising extruding a composition consisting of a settable fluid as a carrier for resilient fibres at least 5 mm in length through a die having a die diameter greater than the die length wherein the viscosity of the settable carrier is sufficiently high to carry the fibres through the die but low enough to allow movement of the fibres as they relax on passing through the die and the composition is extruded at a sufficient rate through the die to prevent relaxation of the fibres before the composition reaches the die whereby relaxation of the fibres causes the extrudate to expand to form an open fibrous structure with randomly dispersed fibres as the extrudate leaves the die characterized in compressing the porous extrudate, while the carrier is in a fluid condition until at least a surface skin of non-foamed material is consolidated from the material of the porous extrudate, into a shaped article.

4,399,086

PROCESS FOR MANUFACTURING FOAMED PLASTIC SHEETS

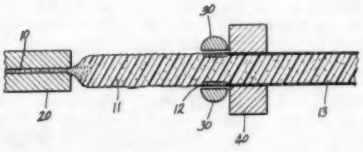
Juris Walter, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 20, 1981, Ser. No. 236,638

Claims priority, application Switzerland, Mar. 4, 1980, 1697/80

Int. Cl.³ B29D *27/00*; B29F *3/08*

U.S. Cl. 264—45.5 18 Claims



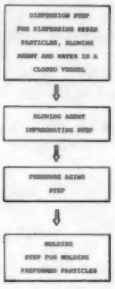
1. A process for the continuous production of wide, thin, foamed thermoplastic sheets characterized by a uniform cell structure and a thin non-foamed outer skin comprising feeding a thermoplastic material containing a foaming agent through the nozzle of an extruder, allowing the extruded thermoplastic to foam freely in an unconfined space so as to allow for substantially complete foaming, cooling the freely substantially completely foamed extruded thermoplastic to a non-formable solid state, selectively heating the surface of the cooled freely substantially completely foamed extruded thermoplastic so that the outer zone of the freely foamed extruded thermoplastic is in a formable state while the core of the freely foamed extruded thermoplastic remains in a non-formable solid state and passing said selectively heated freely foamed extruded thermoplastic through a calibrating device so as to produce a foamed thermoplastic sheet of desired thickness having a thin non-foamed outer skin.

4,399,087

PROCESS FOR PRODUCING FOAMED POLYOLEFIN ARTICLES FROM AGED PRE-FOAMED PARTICLES OF POLYOLEFIN RESINS

Hiroyuki Akiyama, Hiratsuka; Susumu Izawa, Utsunomiya; Kuninori Hirosawa, Isehara, and Hideharu Inada, Hiratsuka, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 275,620
Claims priority, application Japan, Jun. 25, 1980, 55-86093
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 6 Claims


DISPERSION STEP FOR DISPERSING RESIN PARTICLES, BLOWING AGENT AND WATER IN A CLOSED VESSEL
BLOWING AGENT IMPREGNATING STEP
PRESSURE AGING STEP
MOLDING STEP FOR MOLDING PREFOAMED PARTICLES

1. In a process for producing a foamed article of a polyolefin resin which comprises filling in a mold pre-foamed particles of a polyolefin resin containing a gaseous mixture consisting of an inorganic gas and a volatile organic blowing agent in their cells and heating them with steam to mold a foamed article; the improvement wherein the pre-foamed particles of the resin are those in which the total pressure of the gaseous mixture is 1.4 to 2.5 kg/cm^2 (abs.), with the partial pressure of the inorganic gas being maintained at 0.4 to 1.1 kg/cm^2 (abs.) and the partial pressure of the volatile blowing agent at 0.8 to 1.6 kg/cm^2 (abs.).

2. The process of claim 1 wherein the pre-foamed particles are prepared by dispersing the volatile blowing agent and the polyolefin resin particles in water in a closed vessel, heating them to a temperature above the softening temperature of the resin particles to impregnate the volatile blowing agent in the resin particles, thereafter maintaining the pressure of the inside of the vessel above the vapor pressure of said blowing agent, opening one end of the vessel to release the particles and water simultaneously therefrom into a low pressure atmosphere than the inside of the vessel to obtain pre-foamed particles, placing the pre-foamed particles in a pressure-proof vessel and aging them under pressure with an inorganic gas or a mixture of it with a volatile blowing agent.

4,399,088

PROCESS AND MOLDING APPARATUS HAVING A MOLD RELEASE COATING ON THE CAVITY THEREOF FOR MOLDING FORMABLE AND HOMOGENEOUS CERAMIC/POLYESTER RESIN MOLDING COMPOSITION

Waldo R. Greene, Voorheesville, N.Y., assignor to PCI Group, Inc., New Bedford, Mass.

Filed Mar. 30, 1981, Ser. No. 249,158
Int. Cl.³ B29D 27/04; B29C 1/04; B28B 7/36
U.S. Cl. 264—54 8 Claims

1. A process for molding comprising the steps of:

A. coating a mold surface with a release agent consisting essentially of 15–30 weight percent of a polyethylene having an average molecular weight within the range of 15,000 to 30,000 and 70–85 weight percent of a mineral oil of 345–355 SSU at 100° F. and where the polyethylene and mineral oil can be admixed and heated to about 140° C. to obtain a clear molten solution which has a viscosity about 250 cps greater than that of the mineral oil alone at the same temperature;

B. applying to the coated mold surface a molding composition comprising a polyester resin and an aqueous, alkali stabilized silica;

C. curing the molding composition and,

D. separating the mold surface from the cured composition.

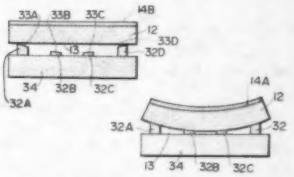
5. The process of claim 1 wherein the molding composition includes a blowing agent selected from the group consisting of calcium carbonate or a blend of calcium carbonate and alumina.

4,399,089

METHOD OF PRODUCING GLAZED CERAMIC SUBSTRATE

Yoshio Mohri; Tsutomu Ikeda; Takashi Hiroishi; Kinzi Sano; Yasuhiro Yamamoto; Yuji Yamamoto, and Ryoji Nakashima, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 7, 1982, Ser. No. 337,745
Claims priority, application Japan, Jan. 6, 1981, 56-603
Int. Cl.³ F27B 21/00
U.S. Cl. 264—57 19 Claims



1. In a method of producing a glazed ceramic substrate having the steps of applying a glass onto a major surface of a plate-shaped ceramic substrate, firing the glass-applied substrate at a temperature above the melting temperature of the glass to thereby form a molten glass layer on the substrate, and cooling the fired substrate to allow the molten glass layer to turn into a solid coating layer, the glass-applied substrate being placed on a refractory base during the firing and cooling steps,

the improvement comprising said refractory base being so shaped as to allow the glass-applied substrate to deform during the firing step such that the deformation offsets against warping of the substrate attributed to a difference between the coefficient of thermal expansion of the glass coating and the coefficient of thermal expansion of the ceramic substrate during the cooling step.

4,399,090

METHOD OF PRODUCING MOULDINGS AND LAYERS OF INORGANIC MATERIALS

Wilhelmus Sprangers, Oosterhout, and Rinse Dijkstra, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,159
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942109
Int. Cl.³ C04B 35/64; B29C 25/00; B05D 3/02
U.S. Cl. 264—63 8 Claims

1. In the method of forming a molding or a layer of an inorganic material by forming a mixture of said inorganic material and a polymeric organic material, molding said mixture into a desired configuration or depositing a layer of said mixture on a substrate and then removing said polymeric organic compound from the resultant molding or layer by subjecting said layer or molding to baking at a temperature of from 150° C.–420° C. for a time sufficient to cause said polymeric organic compound to be volatilized and removed, the

improvement wherein prior to the baking there is added to said mixture a metallic organic compound of the general formula M Rn wherein

M=V^{III}, Mn^{II}, Mn^{III}, In^{III}, Ca^{II}, Co^{III}, Ni^{II}, VO^{II} or VO^{III}

N=2 or 3 and

R=an organic residue of polyunsaturated compounds, carboxylic acids, enolisable ketones, ketoximes, aldoximes, amines or phosphines,

and capable of being converted to an oxide of M when heated to 150° C.–420° C.

4,399,091

COMFORT ADDITIVE FOR ACRYLIC FIBERS

Stephen E. Eisenstein, Oak Park, and Edward M. Dexheimer, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 22, 1982, Ser. No. 360,456
Int. Cl.³ D01D 5/08; D01F 6/18
U.S. Cl. 264—182 **20 Claims**

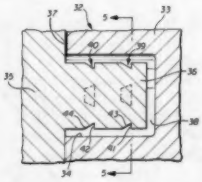
1. In the process of producing filaments by spinning a solution comprising a solvent and a filament forming acrylonitrile polymer, the improvement comprising adding to said solution a polymer obtained by cross-linking a polyether with an isocyanate.

4,399,092

MANUFACTURE OF PIPE THREAD PROTECTORS

Roger L. Snow, Sr., 10923 Loch Bend Ct., Houston, Tex. 77086, and Thomas J. Atkinson, 11735 Fannview, Houston, Tex. 77070

Filed Jul. 20, 1981, Ser. No. 284,690
Int. Cl.³ B29D 1/00
U.S. Cl. 264—318 **12 Claims**



1. A method of manufacturing a cup shaped thread protector comprising a cup shaped or hollow cylindrical member of soft, elastic thermoplastic material having a rear end or closed end wall, a cylindrical side wall and an open forward end,

a plurality of circumferentially oriented lugs spaced circumferentially from each other on and extending from the inner surface of said side wall and integral therewith, and

each of said lugs being of a size and shape permitting the same to be forced over the threaded end of a pipe and to fit into and engage the threads thereof to prevent easy and accidental removal therefrom,

said method comprising:

providing injection molding apparatus comprising a first mold member having a cylindrical female mold cavity and a second mold member comprising a male mold member having recesses in the surface thereof forming a negative image of said lugs on said cup shaped or hollow cylindrical member,

placing said second mold member inside said first mold member to define a cup shaped or hollow cylindrical mold cavity,

injecting hot, fluid, thermoplastic resin into said cup shaped or hollow cylindrical mold cavity to fill the same,

allowing said resin to cool and solidify in said cup shaped mold cavity to produce said cup shaped or hollow cylindrical member,

twisting said second mold member a fraction of a turn, sufficient to compress the lugs on said cup shaped or hollow cylindrical member into the cylindrical wall thereof, after said resin has solidified but before the same has cooled substantially.

withdrawing said second mold member from said cup shaped member and from said first mold member, and

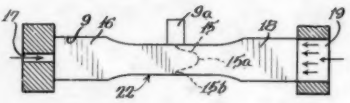
separating said cup shaped or hollow cylindrical member from said first mold member and allowing said lugs to recover from compression into said cylindrical wall into an inwardly extending position and to cool in such position.

4,399,093

INJECTION MOLDING METHOD AND EQUIPMENT

David B. Kirby, Lincoln Township, Berrien County, Mich., and Otfried W. G. Heybey, Springettsbury Township, York County, Pa., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 26, 1981, Ser. No. 277,822
Int. Cl.³ B29F 1/08
U.S. Cl. 264—328.2 **9 Claims**



1. The method of molding an element from synthetic resin comprising the steps of:

injecting fluid synthetic resin through a first gate into a mold cavity to fill the mold, while concurrently injecting fluid synthetic resin at substantially the same temperature as that of the resin being injected through said first gate through a second gate into said mold cavity to fill the mold;

transferring heat from the resin passing through the respective gates at different rates such that the resin received in the mold cavity through the second gate solidifies in the second gate sooner than the resin received in the mold cavity through the first gate, the resin streams from the respective gates flowing through the mold cavity into abutment with each other to define a joint therebetween;

packing the resin in the mold cavity by application of pressure to the resin in the mold cavity, the different solidification rates of the resins received through the respective gates being sufficient to cause a leading surface portion of the resin received through said first gate to project substantially into a leading surface portion of the resin received through said second gate during said mold packing step to provide a non-planar, relatively large area joint therebetween having substantial strength after the element is cooled;

cooling the element; and

removing the element from the mold.

4,399,094

PROCESS AND APPARATUS FOR FORMING A PLASTIC FILM

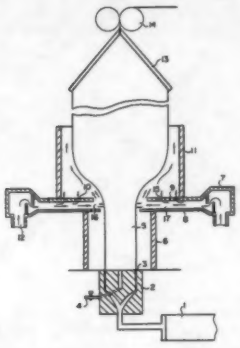
Shigeo Fujitani, and Youichi Matsuda, both of Yokohamashi, Japan, assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 26, 1981, Ser. No. 267,353
Claims priority, application Japan, May 30, 1980, 55-72587
Int. Cl.³ B29D 7/22
U.S. Cl. 264—566 **6 Claims**

1. In a process for forming a plastic film from a thermoplastic resin by blow-film extrusion, the improvement which comprises subjecting the molten tubular film extruded from a die to annealing in a first enclosed space, immediately thereafter

blowing cold air for rapid cooling to the outer surface of said tubular film in the direction perpendicular to the axis thereof, and permitting said tubular film to expand and solidify in a second enclosed space, while it is in contact with cold air flowing in the same direction as said tubular film travel.

5. An apparatus for forming a plastic film which comprises a molten resin extrusion die having a circular die lip and an air



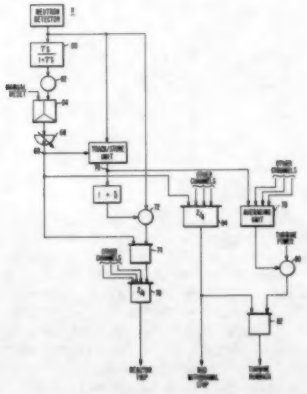
port, an annealing chamber of cylindrical body installed concentrically outside said die lip, an air ring which is installed in contact with said annealing chamber and is provided with a blow-off slit which opens horizontally at the end of a circular air passage and with apertures of slits and/or holes formed on the upper plate ring thereof, and an air flow rectifying cylindrical body installed outside said apertures on said upper plate ring.

4,399,095

PROTECTION AND CONTROL SYSTEM FOR A NUCLEAR REACTOR

Peter J. Morris, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1977, Ser. No. 861,131
Int. Cl.³ G21C *7/36*
U.S. Cl. 376—216 **7 Claims**



1. A nuclear reactor plant control system responsive to a given indication of a malfunctioning operating system affecting reactor core power output to automatically modify plant operation to permit sustained reactor operation with the malfunction, at a reduced power level within the design margin of the reactor system, comprising:

means for monitoring an operating parameter of the reactor indicative of core power output and providing a first representative electrical output;

means for identifying a given abnormal rate of change in the operating parameter indicative of the malfunction and providing a second corresponding electrical output;

means for identifying from the first and second outputs the core power output within a predetermined time of identifying the abnormal rate of change of the operating parameter; and

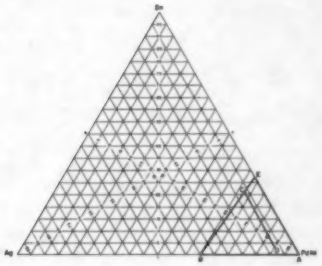
means for modifying the operating conditions of the plant to maintain a sustained reactor core power output below the value identified from the first and second outputs plus a given margin.

4,399,096

HIGH TEMPERATURE BRAZING ALLOYS

Dwarika P. Agarwal, Williamsville, and Clyde E. Ingersoll, Tonawanda, both of N.Y., assignors to Williams Gold Refining Company Incorporated, Buffalo, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,700
Int. Cl.³ C22C *30/00, 5/04, 19/03*
U.S. Cl. 420—463 **12 Claims**



1. A brazing alloy for joining chromium containing base metal alloys, said brazing alloy having sufficient strength and corrosion resistance to withstand subsequent heating to temperatures up to about 1800° F. without undergoing any significant distortion or sagging, consisting essentially of the following constituents in the indicated percentages by weight: palladium about 39%–60%, nickel about 20%–47.5% and at least one element selected from the group consisting of silver 0–35%, tin 0–32%, indium 0–32% and gallium 0–11%; and optionally containing one or more elements selected from the group consisting of gold 0–10%, germanium 0–4.4% and silicon 0–2.9%.

4,399,097

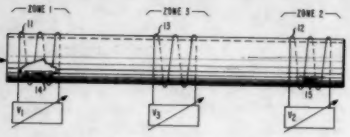
PREPARATION OF III-V MATERIALS BY REDUCTION

Patrick K. Gallagher, Basking Ridge, and Murray Robbins, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 29, 1981, Ser. No. 288,000
Int. Cl.³ C22C *12/00, 28/00*
U.S. Cl. 420—555 **10 Claims**

1. A method of producing a material comprising at least one first element selected from the group consisting of gallium and indium, and at least one second element selected from the group consisting of antimony, arsenic, and phosphorus, char-

acterized by reducing in an atmosphere comprising hydrogen at least one salt of the form $Ma(NH_4)_b Hc(XO_4)_y$, where M is



said at least one first element, and X is said at least one second element, where $a \leqq y$ and $(b+c)/3=y-a$.

4,399,098

PREVENTION OF CORROSION IN AQUEOUS SOLUTIONS

Dionisio G. Cuisia, Chicago, Ill., assignor to Dearborn Chemical Company, Lake Zurich, Ill.

Filed Sep. 21, 1981, Ser. No. 303,964

Int. Cl.³ C23F *11/06*

U.S. Cl. 422—13 **10 Claims**

1. A method for control of corrosion of ferrous metal surfaces in boiler water systems caused by dissolved oxygen in the water which comprises adding to the system from 0.001 to 500 ppm of an oxygen scavenger comprising semicarbazide or a salt thereof.

10. The method according to claim **1** in which the boiler water system comprises alkaline boiler water.

4,399,099

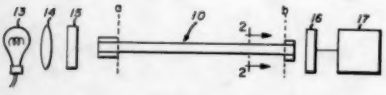
OPTICAL FIBER APPARATUS FOR QUANTITATIVE ANALYSIS

Richard G. Buckles, 2465 Chestnut St., Apt. 201, San Francisco, Calif. 94123

Division of Ser. No. 76,984, Sep. 20, 1979, Pat. No. 4,321,057. This application Sep. 14, 1981, Ser. No. 302,242

Int. Cl.³ G01N *21/64*

U.S. Cl. 422—58 **25 Claims**



1. An optical fiber device for the quantitative analysis of oxygen in a fluid, said device comprising a fibersheath element including a fiber capable of transmitting electromagnetic energy in the visible and ultraviolet ranges and defining a path for the transmission of said energy, a first oxygen-permeable sheath surrounding said fiber, an oxygen-quenchable, fluorescent dye incorporated into the material forming said fiber or said sheath and means for reflecting said electromagnetic radiation from said sheath into said fiber, whereby the modification of the fluorescence caused by the quenching thereof by oxygen is cumulative along the length of said path.

4,399,100

AUTOMATIC PROCESS CONTROL SYSTEM AND METHOD FOR CURING POLYMERIC MATERIALS

Andrew Zsolnay, Manhattan Beach, Calif.; Kelly M. Perkins, Anchorage, Ak., and Leiv H. Blad, Van Nuys, CA, assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 29, 1980, Ser. No. 220,369

Int. Cl.³ G06G *7/58*; G01N *27/22, 33/44*

U.S. Cl. 422—62 **6 Claims**

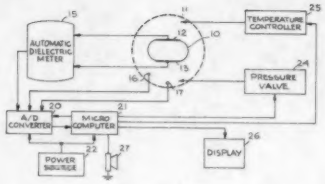
1. An improved system for curing a polymeric material comprising:

(a) heating means adapted to apply heat to said polymeric material;

(b) pressure application means adapted to apply pressure to said polymeric material, said application of heat and pressure acting to cure said polymeric material;

(c) dielectric monitoring means for measuring the capacitance of said polymeric material as said polymeric material is being cured and for generating a signal representative of said capacitance; and

(d) computer means coupled to said monitoring means and said heating and pressure applications means for controlling the application of said heat and said pressure and for receiving said signal from said monitoring means and determining therefrom the optimum time to generate a control signal to apply to said pressure application means to cure said polymeric material, said optimum time occurring when said capacitance reaches a minimum value, said computer means including means for determining said minimum value of said capacitance measurements and means for generating said control signal immediately after said capacitance measurements pass through said minimum value.



4,399,101

STOPPED-FLOW APPARATUS

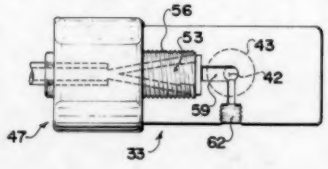
Alan Queen, 35 Purdue Bay, Winnipeg, Manitoba, Canada R3T 3C6

Filed Jun. 9, 1981, Ser. No. 271,820

Claims priority, application United Kingdom, Jun. 10, 1980, 8018897

Int. Cl.³ G01N *21/75*

U.S. Cl. 422—68 **6 Claims**



1. Stopped-flow apparatus for observing and measuring the rates of fast reactions in solutions comprising, in combination, supporting structure, at least one flow assembly on said supporting structure, said flow assembly including a temperature controlled enclosure on said supporting structure, a reaction cell detachably supported within said enclosure, a mixing chamber detachably and operatively connected to said reaction cell, at least two syringe assemblies mounted on said supporting structure and being operatively connected to said mixing chamber, means mounted on said supporting structure to supply said syringes with solutions to be mixed in said mixing chamber, a drive system for said syringes being operatively connected thereto, adjustable stopping means on said support structure operatively connected to said reaction cell, and drain means detachably secured to said reaction cell; said mixing

chamber, said light source, said detachable means and said drain means all being screw threadably secured to said cell in operative relationship thereto for facilitating connection and disconnection therewith, said mixing chamber including a block, inlet means on one side of said block and outlet means on the other side thereof screw threadably connectable to said cell, said inlet means including means operatively connecting same to each of said syringes, a bifurcated bore in the shape of an inverted V extending from each of said means operatively connecting said inlet means to each of said syringes, each leg of said bifurcated bore communicating at the end thereof with a different side of the inner end of said outlet means and with the end of the leg of the other bifurcated bore to form a first point mixing, one mixing zone upon each side of said inner end of said outlet means, and being substantially diametrically located within said block forming said mixing chamber, the outer end of said outlet means constituting a second point mixing at the area of connection of said outlet means to said cell.

4,399,102

PROCESS AND APPARATUS FOR FLOW INJECTION EXTRACTION

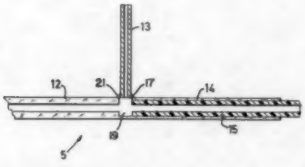
Bo I. Karlberg, and Sidsel Thelander, both of Södertälje, Sweden, assignors to Bifok AB, Sollentuna, Sweden

Continuation of Ser. No. 948,629, Oct. 3, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 232,214

Claims priority, application Sweden, Oct. 3, 1977, 7711016

Int. Cl.³ G01N *1/14*

U.S. Cl. 422—82 **10 Claims**



1. An apparatus for combining two immiscible liquids to form a stream of alternating immiscible liquid segments of suitable size for extraction interaction while moving through a conduit, said apparatus comprising:

a straight duct including an inlet tube portion defining a first inlet passageway having a rear edge, an outlet tube portion defining an outlet passageway having a front edge, said outlet passageway having a cross-sectional area in the range of from 0.7 to 1.2 times that of said first inlet passageway and having walls with a lower surface tension than said first inlet passageway, said straight duct further including a cavity portion located between said first inlet passageway rear edge and said outlet passageway front edge, said cavity having a cross-sectional area greater than the cross-section area of either of said first inlet passaeway or outlet passageway; and

an inlet tube connected in flow communication to said straight duct at said cavity and substantially perpendicular to said straight duct, said inlet tube defining a second inlet passageway having an inlet opening into said cavity through which one immiscible liquid is passed for combination in said cavity with another immiscible liquid passed into said cavity through said first inlet passageway, said second inlet passageway having a cross-sectional area from $\frac{1}{4}$ to $\frac{1}{2}$ of the cross-sectional area of said first inlet passageway and said second passageway inlet opening being located along said cavity in front of said outlet passageway front edge a distance of from 1 to 3 times the diameter of said outlet passageway, wherein said immiscible liquids passing through said inlet passageways are combined to form said stream of alternating immiscible liquid segments of suitable size for extraction interaction which flows through said outlet passageway.

4,399,103

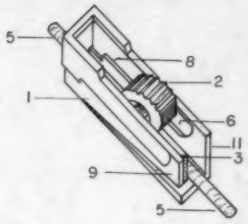
BLOOD DISPENSER DEVICE

Louis T. Ferrara, 2988 Ave. T, Brooklyn, N.Y. 11229

Filed Jan. 28, 1981, Ser. No. 229,120

Int. Cl.³ G01N *1/00*; B65D *35/28*

U.S. Cl. 422—100 **1 Claim**



1. A device for dispensing blood in a controlled, dropwise manner, said device comprising: a support means having a rectangularly shaped base member, a first upstanding vertical wall connected along a longitudinal edge to a longitudinal edge of said base member, a second upstanding vertical wall having first and second ends and having one of the longitudinal edges therebetween connected to the other longitudinal edge of said base member at said first end only whereby said second end is free to be displaced towards said first upstanding vertical wall, said upstanding vertical walls forming therebetween respective openings at the end of said support means to facilitate the placement of a blood conveying tube, each of said upstanding vertical walls having a notched surface extending along the longitudinal length thereof and forming a track or bearing surface, said track or bearing surface being of a stepped configuration so that the track or bearing surface has a substantial first portion, starting adjacent said second free end and at a first height above said base member and extends to said first end at a second lower height above said base member; a wheel member having a centrally located axle which axle is received in the notch and engages the track or bearing surface, said wheel member having circumferentially located grooves which are parallel to said axle; knife means connected to said second free end; and tube means located between said base member, vertical upstanding walls and wheel whereby blood may be dispensed in a controlled dropwise manner from said tube.

4,399,104

DEVICE FOR THE PRODUCTION OF A REACTION MIXTURE FROM FLOWABLE FOAM-FORMING OR SOLID-FORMING COMPONENTS

Rolf Coblenz, Cologne; Klaus Schulte, Leverkusen; Wilfried Ebeling, Cologne, and Dieter Evertz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,487

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936223

Int. Cl.³ B01J *14/00*; B01F *15/02*

U.S. Cl. 422—111 **1 Claim**

1. A device for producing a reaction mixture from flowable foam-forming or solid-forming components, which, for each component comprise:

(a) a storage container, from which

(b) a feed pipe leads to a common mix head which

(c) contains a mixing chamber into which the feed pipe opens,

(d) a metering pump with an adjustable output, a pressure

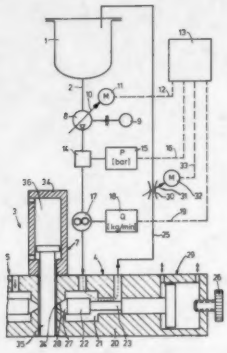
measuring device and a quantitative rate of flow meter being arranged in the feed pipe, and in that

(e) a needle nozzle and an exteriorly-controlled, hydraulically-movable needle with an associated stroke adjusting device is provided in the mix head,

(f) wherein the needle nozzle,

(g) has a circulation channel, and

(ga) connects the feed pipe to a return pipe in the circulation position,



(gb) connects the feed pipe to the mixing chamber in the mixing position, and wherein

(h) an adjustable throttling means is provided in the return pipe,

characterized in that

(i) the metering pump is provided with an adjusting member,

(j) the throttling means is provided with an adjusting member, and that

(k) the adjusting members, the flow meter and the pressure measuring device are connected to a control computer.

4,399,105

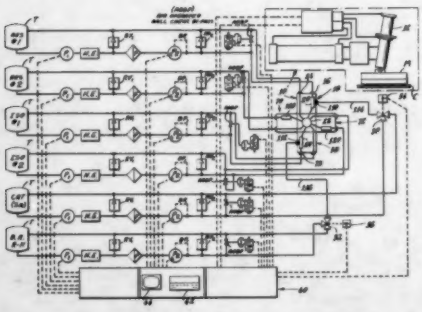
PROGRAMMABLE COMPUTER CONTROLLED REACTION INJECTION MIXING HEAD SYSTEM

Peter Tilgner, Akron; Robert D. Wingard, Kent; Shirley M. Leida, Akron, and Kenneth L. Erwin, Jr., Kent, all of Ohio, assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 30, 1981, Ser. No. 249,136

Int. Cl.[3] **B01F** *15/02, 15/04;* **B01J** *14/00;* **G05D** *16/00*

U.S. Cl. 422—111 **9 Claims**



1. In a system incorporating a high pressure reaction injection mixing head for mixing selected ones of different fluid components to produce polymeric molding mixtures whose compositions may be rapidly changed between successive pour cycles in filling a series of molds, the combination of:

separate flow paths including means for storing, transporting to said mixing head and recirculating to storage each component individually and including in each separate flow path apparatus for inducing a high pressure in that component as it enters said head during a mix/pour cycle of said head;

programmable computer means for selectively pre-setting said high pressure and the time of flow under said pressure of each component during a mix/pour cycle, said computer including means for producing base reference signals characteristic of the respective pressure and flow time selected for each component;

component sensing means for each component producing signals characteristic of the pressure and flow times actually occurring during the mix/pour cycle;

comparator means producing signals responsive to any difference between the signals from said respective component sensing means and said base reference signals; and

means sensitive to said comparator response to vary the output of said high pressure inducing apparatus so as to effect cancellation of said comparator response.

4,399,106

REACTOR FOR PREPARING URANIUM TRIOXIDE

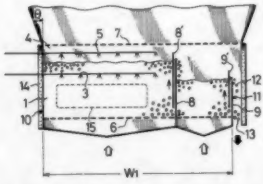
Kimio Ueda, Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 295,999

Claims priority, application Japan, Sep. 2, 1980, 55-120693

Int. Cl.[3] **C01G** *43/01*

U.S. Cl. 422—140 **17 Claims**



1. A fluidized-bed reactor for preparing a nuclear fuel by heat decomposing a nitrate comprising:

(a) a parallelepiped-shaped fluidized-bed which satisfies the critical safety shape of ^{235}U,

(b) means for supplying an aqueous solution of the nitrate into the reactor, said supply means having a plurality of openings, and

(c) at least one barrier for dividing the fluidized-bed into at least two reaction rooms, the bottom of said at least one barrier being moveable to control the distance from the floor of the reaction room to the bottom of the barrier for removal of particles generated in the fluidized-bed, the removal of nuclear fuel particles from the reactor being mainly by overflowing each of the barriers.

4,399,107

ANTI-POLLUTION AND ENERGY CONSERVATION SYSTEM

Ranendra K. Bose, 6728 Carmen St., Metairie, La. 70003

Continuation-in-part of Ser. No. 000,173, Jan. 2, 1979, Pat. No. 4,235,845. This application May 29, 1980, Ser. No. 154,479

Int. Cl.[3] **B01D** *53/34*

U.S. Cl. 422—170 **3 Claims**

1. In a system of the kind described for separating aldehyde pollutants from exhaust flow wherein said system has means for separating combustible and non-combustible exhaust components in exhaust gas, the improvement which comprises:

a pair of chemical separation chambers connected in tandem

for serial flow of the combustible exhaust gas component therethrough;

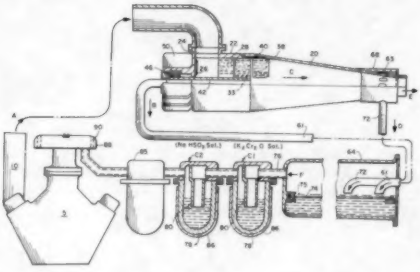
one such chemical chamber having an aldehyde oxidizer and the second such chemical chamber having a higher aldehyde absorbent, for removal of aldehydes from said exhaust flow;

means for passing exhaust flow serially through such chemical chambers for retention in respective chambers of aldehyde components of exhaust gas;

including in combination therewith a mixing chamber upstream of said tandem chemical chambers and a scrubber chamber downstream of said tandem chemical chambers;

a multi-chamber tank and all of said chambers being comprised therein and being connected serially for sequential flow of exhaust gas therethrough;

said tank having an open top for all said chambers;



cover means sealingly closing the open tops of said chambers;

including tubes carried by said cover means for conducting exhaust flow sequentially through said chambers;

said cover means comprising an integral cover extending across the tops of said chambers and respective means sealing said cover at the open top of each said chamber;

said tubes comprising U-shaped members extending downwardly through said cover from said mixing chamber and each chemical chamber to said scrubber chamber so as to connect all of said chambers for flow sequence wherein each said chamber contains a liquid solution and the downstream ends of said tubes in said chemical and scrubber chambers extend below the surface of the liquid in the downstream chamber and wherein the upstream end of each of said tubes is above the liquid in the respective upstream chamber.

4,399,108

METHOD FOR REPROCESSING AND SEPARATING SPENT NUCLEAR FUELS

Oscar H. Krikorian, Danville; John Z. Grens, Livermore, and William H. Parrish, Sr., Walnut Creek, all of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 19, 1982, Ser. No. 340,591

Int. Cl.[3] **C01G** *56/00, 43/00;* **C01F** *15/00;* **G21C** *19/48*

U.S. Cl. 423—5 **30 Claims**

23. A method for reprocessing and separating spent nuclear fuels comprising actinide fuels, volatile and non-volatile fission products, comprising:

providing a separation vessel formed from a carbon-containing material housing a molten metal solvent, said separation vessel including an aperture disposed within a vessel wall member;

introducing spent nuclear fuels into said separation vessel;

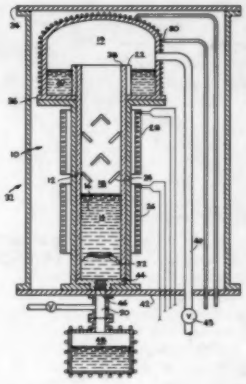
forming CO within said molten metal solvent from actinide fuels which are oxides;

removing CO and volatile fission products from said separation vessel;

introducing a nitriding catalyst into said vessel which increases the affinity for nitrogen in said molten metal solvent;

introducing a non-oxidizing nitrogen-containing atmosphere into said separation vessel;

forming solid nitrides from said actinide fuels within said molten metal solvent; and



separating said solid actinide nitrides from said molten metal solvent and non-volatile fission products.

28. The method according to claim **23**, further comprising including a another and different catalyst to said molten metal solvent which increases the solubility of carbon in said molten metal solvent.

4,399,109

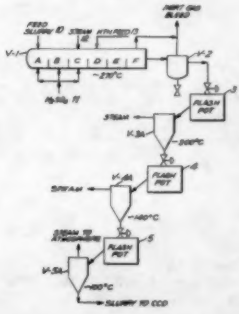
CONTROL OF SILICA SCALING DURING ACID LEACHING OF LATERITIC ORE

Ralph K. Iler, Wilmington, Del.; Paul B. Queneau, Golden, and Mark W. Cooperrider, Arvada, both of Colo., assignors to Compagnie Francaise d'Entreprises Minieres, Metallurgiques et d'Investissements, Paris, France

Filed Feb. 26, 1982, Ser. No. 352,537

Int. Cl.[3] **C22B** *3/00;* **C01G** *53/11*

U.S. Cl. 423—141 **10 Claims**



9. In a method for inhibiting the formation of silica scale on flash-pot surfaces during the multi-stage flashing of sulfuric acid pressure leach slurry obtained following the continuous autoclave leaching of nickel lateritic ore at elevated temperature and pressure during which silica is dissolved, wherein said leach slurry is subjected to a high-temperature flash stage in the range of about 190° C. to 230° C. such that the slurry at said flash temperature is supersaturated in silica, and wherein said

slurry is thereafter subjected to at least one additional flash at an intermediate-temperature flash stage in the range of about 120° C. to 180° C. at which silica precipitates and tends to form a scale accompanied by a decrease in said supersaturation, the improvement which comprises,

recycling a substantial portion of the slurry to said intermediate-temperature stage following flashing to said intermediate-temperature flash stage,

said portion recycled being sufficient to effect a dilution in soluble silica concentration of the slurry fed to said intermediate-temperature flash stage from the higher temperature stage,

the amount of supersaturation after recycling to said intermediate-temperature stage being determined by the following formula:

$$S_{IT} = \frac{(FS_F + R)}{(F + R)},$$

wherein:

S_{IT}=supersaturation ratio at the intermediate temperature;

F=the mass flow rate of the stream of supersaturated silica entering the high-temperature stage;

S_F=the supersaturation ratio of soluble silica in the stream being flashed from the high-temperature stage to the intermediate-temperature stage;

R=the recirculation flow rate;

and wherein F/R ranges from about 0.5 to 2,

and continuing said multi-stage flashing and said recycling of said flashed slurry to said intermediate-temperature flash stage,

whereby silica scale formation at the intermediate-temperature flash stage is greatly inhibited.

4,399,110

PROCESS FOR REDUCING THE RADIOACTIVITY OF CALCIUM SULFATE PREPARED FROM PHOSPHATE ROCK

Hans-Friedrich Kurandt, Lüneburg, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,681

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021839

Int. Cl.³ C01F *11/46, 5/12;* **C01B** *25/16;* **C01G** *43/00*

U.S. Cl. 423—167 **4 Claims**

1. A process for producing calcium sulfate having low levels of radioactivity from phosphate rock comprising:

(1) reacting said phosphate rock with sulfuric acid, whereby a slurry is produced;

(2) adding to said slurry a concentrated mineral acid selected from the group consisting of nitric acid and hydrochloric acid, and an ammonium salt selected from the group consisting of ammonium nitrate and ammonium phosphate; and

(3) separating calcium sulfate from the soluble reaction products and phosphoric acid in said slurry.

4,399,111

PROCESS FOR REMOVAL OF SOUR GASES BY SCRUBBING

Karl Baur, Baierbrunn; Eberhard Lassmann, Eurasburg, and Heinz Karwat, Pullach, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

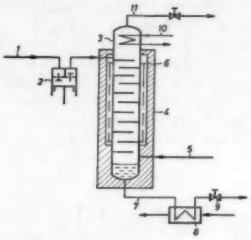
Filed Apr. 14, 1982, Ser. No. 368,252

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3117084

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—226 **18 Claims**

1. In a continuous process for removing sour gas comprising H_2S and/or CO_2 from a gaseous mixture, which process comprises scrubbing the gaseous mixture with an aqueous solution comprising a salt of an alkali metal and a weak inorganic acid as the scrubbing liquid; subjecting resultant loaded scrubbing liquid to regeneration by pressure reduction; and recycling regenerated scrubbing liquid to the scrubbing stage, the improvement wherein carboxylic acids are introduced with the gaseous mixture in trace amounts and/or are formed during the



scrubbing stage, and form salts with alkali metal cations in the scrubbing liquid, and which comprises subjecting a continuous partial stream of the scrubbing liquid to an oxidation step under conditions sufficient to liberate alkali metal cations from the salts of said carboxylic acids contained in the scrubbing liquid to reconstitute the scrubbing liquid with said salt of an alkali metal and a weak inorganic acid.

4,399,112

PROCESS FOR THE CATALYTIC INCINERATION OF RESIDUAL GASES CONTAINING A LOW CONTENT OF AT LEAST ONE SULFUR COMPOUND SELECTED FROM COS, CS_2 AND THE MERCAPTANS AND POSSIBILITY AT LEAST ONE MEMBER OF THE GROUP

Robert Voirin, Mourenx, France, assignor to Societe Nationale Elf Aquitaine, Paris, France

Filed Apr. 21, 1981, Ser. No. 255,995

Claims priority, application France, Apr. 23, 1980, 80 09129

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—230 **17 Claims**

1. A process for the catalytic incineration of residual gases containing a low content of at least one sulfur compound selected from COS, CS_2 and mercaptans, comprising: hydrogenating the residual gas to react said sulfur compound contained therein to form H_2S; and contacting the hydrogenated residual gas with an oxygen-containing gas in the presence of an oxidation catalyst at a temperature between about 150° C. and 570° C. to thereby oxidize H_2S to SO_2, wherein the oxidation catalyst comprises a porous support having a surface area of at least 5 m^2/g consisting essentially of from about 50 to 100% by weight of at least one composition selected from the group consisting of titanium oxides expressed as TiO_2, zirconium oxides expressed as ZrO_2, silica, zeolites and mixtures thereof and from 50 to 0% by weight alumina, and iron sulphate in an amount such that the iron content of the catalyst is between about 0.1 and 15% by weight.

4,399,113

PROCESS FOR TREATING A GAS CONTAINING A FLUORINE COMPOUND

Susumu Tosaka, Joetsu; Tadamichi Abe, Tokyo; Hozumi Endo, Komae, and Kiyohiro Ogawa, Joetsu, all of Japan, assignors to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,712

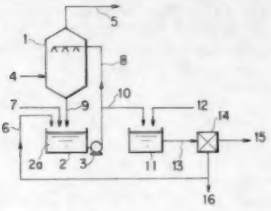
Claims priority, application Japan, Dec. 11, 1980, 55-174818

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—240 **7 Claims**

1. A process for treating a gas containing a fluorine compound which comprises the steps of:

contacting said gas with an aqueous solution as an absorbent containing aluminum fluoride and sulfate radical at a concentration of 3 to 30 g/l to absorb the fluorine compound,



producing a solid phase including aluminum fluoride hydrate and/or basic aluminum fluoride by adding aluminum hydroxide and/or alumina to the resultant aqueous solution obtained in the absorbing step, and

separating said solid phase from a slurry containing said solid phase obtained in the producing step.

4,399,114

PROCESS FOR THE DEARSENIFICATION OF POLYPHOSPHORIC ACID

Alexander Maurer, Hürth; Gero Heymer, Erftstadt, and Markus Erpenbach, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,941

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132428

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 R **5 Claims**

1. In the process for the continuous dearsenification of polyphosphoric acid, wherein the acid heated to a temperature of more than 80° C. is introduced from above into a gas admission zone, contacted countercurrently therein with circulated gaseous hydrogen sulfide introduced into the gas admission zone from below, the arsenic being precipitated in the form of arsenic sulfide, and the acid being separated from the arsenic sulfide by filtration and also from excess gaseous hydrogen sulfide by means of compressed air, the improvement which comprises:

(a) dearsenifying the polyphosphoric acid in a gas admission zone subdivided so as to comprise at least two separate liquid matter-receiving zones, each zone being separated from the other by means of a separate gas zone;

(b) maintaining the liquid in each of the liquid matter-receiving zones at a level 0.1 up to 10 cm high, without admission of gas;

(c) permitting hydrogen sulfide which remained unreacted in the individual liquid matter-receiving zones to collect in the respective gas zones and finely redispersing it in the liquid matter-receiving zone directly upstream of the respective gas zone by allowing the hydrogen sulfide to flow through a plurality of openings into the acid, the latter being delivered from the respective liquid-matter-receiving zone to the next downstream liquid-matter-receiving zone, and introduced thereinto directly below the liquid matter level therein;

(d) separating precipitated arsenic sulfide from the acid coming from the lower end of the gas admission zone, and

(e) freeing the filtrate obtained from excess gaseous hydrogen sulfide.

4,399,115

SYNTHESIS OF SILICON NITRIDE

Kimihiko Sato, Yokohama; Kunihiko Terase, Tokyo, and Hitoshi Kijimuta, Ebina, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,591

Claims priority, application Japan, Apr. 21, 1981, 56-59164

Int. Cl.³ C01B *21/068*

U.S. Cl. 423—344 **5 Claims**

1. A process for producing α-silicon nitride comprising:

reacting a silicon halide and ammonia to form silicon nitride, wherein, at least while the reaction product of said silicon halide and said ammonia is amorphous, supplying the heat necessary to sustain the reaction by burning hydrogen and chlorine in the presence of said silicon halide and said ammonia, whereby the reaction is effected by the heat of combustion of said hydrogen and chlorine.

4,399,116

ZONE PURIFICATION OF SILICON IN A REACTIVE PLASMA

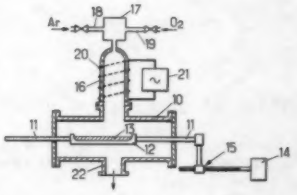
Jacques Amouroux, and Daniel Morvan, both of Paris, France, assignors to Electricite de France (Service National), Paris, France

Filed Jul. 28, 1981, Ser. No. 287,789

Claims priority, application France, Aug. 8, 1980, 80 17120

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—348 **7 Claims**



1. A process for zone melting purification of silicon, comprising the steps of melting a zone of a bar of silicon to be purified by directing a jet of hot plasma obtained by high frequency excitation onto said zone and moving the jet and bar with respect to each other so as to cause the melted zone to travel along the bar, wherein the plasma is formed from a mixture of a plasma-producing gas and a sufficiently small amount of oxygen to avoid substantial oxidation of silicon.

4,399,117

PRODUCTION OF NEUTRAL CALCIUM HYPOCHLORITE FROM ITS DIBASIC SALT

Walter J. Sakowski, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 4, 1982, Ser. No. 345,869

Int. Cl.³ C01B *11/06*

U.S. Cl. 423—474 **9 Claims**

1. A process for producing neutral calcium hypochlorite which comprises:

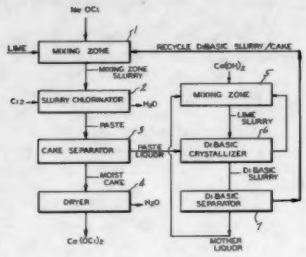
(a) admixing lime, an alkali metal hypochlorite and dibasic calcium hypochlorite crystals in a mixing zone to form a mixing zone slurry;

(b) reacting said mixing zone slurry with chlorine to form a paste of neutral calcium hypochlorite;

(c) separating said paste into a cake of neutral calcium hypochlorite and a paste liquor;

(d) reacting said paste liquor with a slurry of lime in a crystallizer to form a slurry of dibasic calcium hypochlorite crystals in a mother liquor while maintaining an oxidation reduction potential in the range of from about 690 to about 705 millivolts;

(e) separating said crystals of dibasic calcium hypochlorite crystals from said dibasic mother liquor; and



(f) recycling said dibasic calcium hypochlorite crystals to said mixing zone.

4,399,118

PROCESS OF RECOVERING ANHYDROUS ZIRCONIUM TETRAFLUORIDE

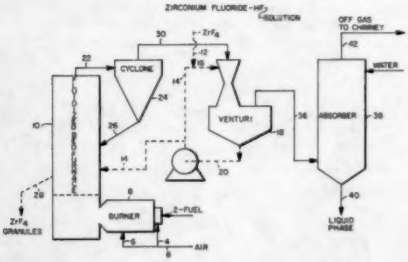
Wolfgang Fennemann, Karben, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,413

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025607

Int. Cl.³ C01G 25/04

U.S. Cl. 423—489 **15 Claims**



1. In a process for making substantially anhydrous zirconium tetrafluoride by drying zirconium fluoride dissolved in aqueous hydrofluoric acid and subsequently calcining the same to remove the water of crystallization in said zirconium fluoride, the improvement wherein the solution is sprayed continually into a fluidized bed oven with a bed of granulated zirconium fluoride and evaporated and zirconium fluoride containing water of crystallization is calcined in a fluidized bed oven with a bed of granulated zirconium fluoride at 220°–300° C. and drawn off from said fluidized bed oven, continually, as granulated product.

4,399,119

MANUFACTURE OF SPHERICAL ALUMINA FROM GIBBSITE

Shizuo Takumi, Kamakura; Toshio Hashimoto, and Masaru Tatsushima, both of Isehara, all of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,654

Claims priority, application Japan, Sep. 29, 1980, 55/135500

Int. Cl.³ C01F 7/02

U.S. Cl. 423—626 **10 Claims**

1. A method of manufacturing spherical alumina particles comprising the steps of:

(a) digesting, at an elevated temperature and an elevated pressure, gibbsite with an aqueous hydrochloric acid solution to thereby form an aqueous basic aluminum chloride solution having an aluminum concentration in the range of from 9 wt.% to 11 wt.% and a weight ratio of aluminum to chloride in the range of from 0.4 to 0.6;

(b) adding, at an elevated temperature, an aqueous ammonia solution to said aqueous basic aluminum chloride solution under conditions effective to form an alumina hydrosol containing ammonium chloride, said alumina hydrosol having an aluminum concentration in the range of from 7 wt.% to 10 wt.% and a weight ratio of aluminum to chloride in the range of from 0.6 to 1.3, wherein said weight ratio of aluminum to chloride is calculated on the basis of excluding the chlorine content of said ammonium chloride;

(c) then commingling said alumina hydrosol with a gelling agent which hydrolyzes at an elevated temperature thereby forming a mixture, and then dispersing droplets of said mixture in a suspending medium under conditions effective to transform said droplets into hydrogel particles; and

(d) ageing said hydrogel particles first in said suspending medium and then in aqueous ammonia, and thereafter washing said hydrogel particles with water, then drying and calcining said hydrogel particles to obtain said spherical alumina particles.

4,399,120

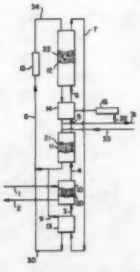
HYDROGEN-WATER ISOTOPIC EXCHANGE PROCESS

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 26, 1979, Ser. No. 106,738

Int. Cl.³ C01B 5/00

U.S. Cl. 423—648 A **23 Claims**



1. A dual temperature isotopic exchange process for the production of a deuterium-enriched fluid stream selected from the group consisting of water and hydrogen comprising:

(a) passing, on a cyclic basis, a gaseous hydrogen stream containing said deuterium isotope (1) upwardly through a lower portion of a hot tower contacting zone, (2) upwardly therefrom through the upper portion of said hot tower, said tower having means to prevent the flow of liquid between said

upper and lower portions thereof, (3) upwardly therefrom through a cold tower contacting zone, and (4) therefrom recirculating said gaseous hydrogen stream to said lower portion of the hot tower, said cold tower and upper portion of the hot tower each having therein a catalyst system wherein the catalyst consists essentially of a metal selected from the group consisting of platinum and palladium and said lower portion of the hot tower having therein a catalyst system wherein the catalyst consists essentially of a metal selected from the group consisting of chromium, iron, cobalt, and nickel, said catalyst systems being capable of catalyzing the exchange of deuterium between said gaseous hydrogen stream and liquid water, said hot tower being maintained at an elevated temperature at which said deuterium is concentrated in the hydrogen stream and said cold tower being maintained at a reduced temperature at which deuterium is concentrated in a liquid water phase;

(b) flowing water, in a closed liquid recirculation loop, (1) downwardly through said cold tower in isotopic exchange relationship with said gaseous hydrogen stream, (2) downwardly through the upper portion of said hot tower in isotopic exchange relationship with said gaseous hydrogen stream, and (3) thereafter recirculating the water to said cold tower;

(c) introducing a feed stream of deuterium-containing water to the top of the lower portion of said hot tower contacting zone for downward flow therethrough in isotopic exchange relationship with said gaseous hydrogen stream, said feed water not contacting water recirculating in said closed loop;

(d) discharging deuterium-depleted water from the bottom of said lower portion of the hot tower to waste; and

(e) removing the fluid stream having an enriched quantity of deuterium isotope therein from between the cold tower and the upper portion of said hot tower contacting zone, whereby the catalyst systems enchance the rate of the hydrogen-water isotopic exchange, the catalyst systems in said cold tower and in the upper portion of the hot tower being isolated from impurities in the feed water, avoiding undue retarding of catalyst activity during the concentration of deuterium at desirable rates in said hydrogen-water isotopic exchange system.

4,399,121

IODOTHYRONINE IMMUNOGENS AND ANTIBODIES

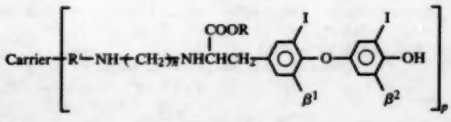
James P. Albarella; Robert J. Carrico, and Thomas M. Li, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 318,026, Nov. 4, 1981, Pat. No. 4,358,604. This application Mar. 29, 1982, Ser. No. 363,084

Int. Cl.³ A61K *39/00, 37/00;* C07C *103/52, 101/32, 67/00*

U.S. Cl. 260—112.5 R 23 Claims

1. An iodothyronine immunogen conjugate of the formula:



wherein Carrier is an immunogenic carrier material, R' is a bond or a linking group, n is an integer from 2 through 12, p is on the average from 1 through about 50, R is hydrogen or alkyl containing 1–6 carbon atoms, and β^1 and β^2 are, independently, hydrogen or iodine.

4,399,122

CONTROLLED RELEASE GRANULES

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 114,729, Feb. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 18,528, Mar. 8, 1979, abandoned. This application Oct. 27, 1981, Ser. No. 315,304

Int. Cl.³ A61K *31/765, 31/775;* A61N *25/26, 25/34*

U.S. Cl. 424—21 9 Claims

1. An insecticidal or nematicidal granule consisting essentially of particles of an inert carrier impregnated or coated with an effective amount of oxamyl and coated or impregnated with a barrier material, said barrier material having a water absorption rate of no greater than about 0.2% when measured for a ¼" specimen in water at 73.4° F. for 24 hours, and said granule being capable of releasing oxamyl in water at 20° C. at a rate of no more than 80% in 4 hours, said barrier material consisting essentially of paraffin wax admixed with up to about 50% of a modifier or combination of modifiers selected from low molecular weight oxidized polyethylenes, ethylene copolymers containing up to about 40% of vinyl acetate comonomer and polyterpenes.

4,399,123

FIBROUS TISSUE DRESSING OR IMPLANT

Roy F. Oliver, 33 Kilmany Rd., Wormet, Fife, Scotland, and Roy A. Grant, "Glen Cottage", 34 Avon Castle, Avon Castle, Ringwood, Hampshire, England

Continuation-in-part of Ser. No. 43,227, May 29, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 221,048

Claims priority, application United Kingdom, Apr. 1, 1980, 8010955

Int. Cl.³ A61K *35/12;* C07G *7/00, 17/00*

U.S. Cl. 424—95 15 Claims

1. A fibrous tissue preparation of mammalian dermal origin which is suitable for homo or heterotransplantation for the permanent repair of or as temporary dressing for cutaneous wounds and soft tissue injuries, which preparation is substantially free of nonfibrous tissue proteins and antigenic polysaccharides, mucopolysaccharides, and glycoproteins.

3. A process for the preparation of a fibrous tissue according to claim 1, which comprises treating below 20° C. a fibrous tissue of mammalian origin with a proteolytic enzyme selected from the group consisting of pepsin, trypsin, chymotrypsin, ficin, and papain, which will, under the conditions of the process, remove non-fibrous tissue proteins, and further treating said fibrous tissue with a carbohydrate-splitting enzyme, selected from the group consisting of amylase, hyaluronidase, and neuramidinase, which will, under the conditions of the process, remove antigenic polysaccharides, mucopolysaccharides and glycoproteins from said fibrous tissue.

4,399,124

PEPTIDES HAVING IMMUNOSTIMULATING PROPERTIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Robert M. Fauve, Paris, France, assignor to Institut Pasteur, Paris, France

PCT No. PCT/FR80/00142, § 371 Date Jun. 1, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/00847, PCT Pub. Date Apr. 2, 1981

PCT Filed Oct. 1, 1980, Ser. No. 268,991

Claims priority, application France, Oct. 1, 1979, 79 24448

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 26 Claims

1. A method of stimulating macrophages in vivo in a host which comprises administering to said host an immunostimulant effective amount of a biologically active composition which comprises a biologically acceptable carrier and a peptide which is effective for stimulating macrophages in vivo

having a prolyl→prolyl→glycyl sequence and a maximum of seven aminoacyl residues.

4,399,125

NOVEL ANTAGONISTS OF THE ANTIDIURETIC ACTION OF ARGININE VASOPRESSIN

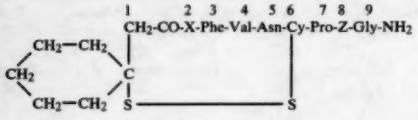
Maurice Manning, 3741 Driftwood, Toledo, Ohio 43614, and Wilbur H. Sawyer, #12 Warnke La., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 247,008, Mar. 24, 1981, Pat. No. 4,367,225. This application Nov. 16, 1981, Ser. No. 322,071

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 13 Claims

1. A compound of the formula



wherein X is D-Phe, D-Val, D-Leu, D-Ile, D-Arg, D-norvaline, D-norleucine, D-cyclohexylalanine, D-α-aminobutyric acid, D-threonine or D-methionine and Z is D- or L-Arg.

4,399,126

MODULATORS OF THE COMPLEMENT SYSTEM

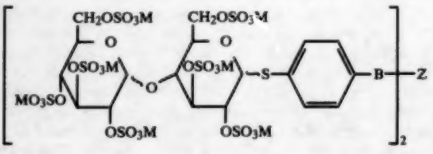
Robert E. Schaub, Upper Saddle River, N.J.; Janis Upesiacis, Pomona, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,047

Int. Cl.³ A61K *31/70, 31/73*; C07H *3/06*

U.S. Cl. 424—180 76 Claims

1. A compound selected from those of the formula:



(~ = α or β)

wherein M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); B is selected from the group consisting of —NHCO—, —$NHSO_2$—, —$NHCH_2$— and —NH—; and Z is a straight or branched chain alkylidene group —$(CH_2)_m$—, where m is an integer 0–12, inclusive, with the proviso that when m is zero or one, B cannot be —$NHSO_2$—.

46. A method of modulating the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula of claim 1.

4,399,127

INJECTABLE OXYTETRACYCLINE COMPOSITIONS

Walter Hacke, Rutherford, N.J., and Herman Horn, Staten Island, N.Y., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation of Ser. No. 139,147, Apr. 10, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,007

Int. Cl.³ A61K *31/65*

U.S. Cl. 424—227 9 Claims

1. A stable, injectable antibiotic composition of increased antibiotic concentration for parenteral administration comprising:

(a) from about 15 to about 35 parts by weight of an antibiotic selected from the group consisting of oxytetracycline base and an acid addition salt thereof,

(b) a magnesium compound selected from the group consisting of magnesium oxide, magnesium hydroxide and magnesium carbonate present in a molar ratio from about 0.8 to about 1.2 moles per mole of said antibiotic,

(c) from about 50 to about 95 parts by weight of glycerol formal selected from the group consisting of 4-hydroxymethyl-1,3-dioxolane, 5-hydroxy-1,3-dioxane and mixtures thereof,

(d) from about 10 to about 45 parts by weight of water,

(e) an antioxidant in an amount sufficient to stabilize said composition, and

(f) a buffering agent in an amount sufficient to provide a pH of from about 6 to about 9.5 in said composition.

4,399,128

PHARMACEUTICAL CARRIER AND COMPOSITIONS

Pierre Hirsbrunner, Corseaux, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jun. 29, 1982, Ser. No. 393,507

Claims priority, application European Pat. Off., Aug. 28, 1981, 81106715.6

Int. Cl.³ A61K *31/60*

U.S. Cl. 424—230 15 Claims

1. A stable, dry ASA (acetylsalicylic acid) composition which on contact with water disperses rapidly to provide a buffered solution of neutralised ASA in a continuous liquid phase containing dissolved milk solids, characterised in that it contains an effective amount of ASA, milk solids in an amount where the weight ratio of the milk solids (expressed on a non-fat basis) to all other ingredients is 3 to 20:1, and tripotassium phosphate in an amount sufficient to neutralise the ASA.

4,399,129

TREATING SHOCK

Elizabeth Gowers, Reading, and Martin H. Todd, Maidenhead, both of England, assignors to John Wyeth and Brother Limited, Maidenhead, England

Filed Jan. 28, 1982, Ser. No. 343,627

Claims priority, application United Kingdom, Feb. 12, 1981, 8104409

Int. Cl.³ A61K *31/33*

U.S. Cl. 424—244 3 Claims

1. A method of treating shock in mammals which comprises administering to a mammal suffering from shock an effective amount of meptazinol or a pharmaceutically acceptable salt thereof.

4,399,130
USE OF METALLIC SALTS OF PYRIDINE-2-THIONE-N-OXIDE TO TREAT OR PREVENT SWINE EXUDATIVE EPIDERMITIS

Jeffrey Davidson, Tulare, Calif.; John G. Babish, Ithaca, N.Y., and John H. Wedig, Guilford, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 1, 1982, Ser. No. 344,905
Int. Cl.³ A61K *31/555, 31/44*
U.S. Cl. 424—245 **5 Claims**

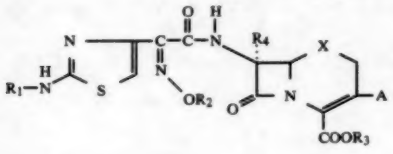
1. A method of treating an animal for swine exudative epidermitis which comprises administering to said animal an effective amount of at least one metallic salt of pyridine-2-thione-N-oxide to treat or prevent swine exudative epidermitis.

4,399,131
CEPHEM DERIVATIVES

Walter Dürckheimer, Hattersheim am Main; Eberhard Ehlers, Hofheim am Taunus; Hubert Seliger, Frankfurt am Main, and Elmar Schrinner, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 896,156, Apr. 13, 1978, abandoned. This application May 5, 1980, Ser. No. 146,780
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716677
Int. Cl.³ A61K *31/545;* **C07D** *501/34*
U.S. Cl. 424—246 **9 Claims**

1. A cephem compound of the formula



wherein the
OR_2 group is in the syn-position and
R_1 is hydrogen or an amino protective group known from peptide chemistry;
R_2 is hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 6 carbon atoms, alkinyl having 3 to 5 carbon atoms, or such alkyl, alkenyl, or alkinyl substituted by
halogen
lower alkoxy carbonyl
phenoxy carbonyl
carboxyl
carbamyl
lower alkyl carbamyl
hydroxy lower alkyl carbamyl
pyrrolidinyl carbonyl
morpholinyl carbonyl
sulfamyl
sulfonyl
hydroxy
lower alkoxy
lower alkanoyloxy
lower alkyl sulfonyl
cycloalkyl having 3 to 6 carbon atoms
phenyl
nitrophenyl
halophenyl
lower alkoxyphenyl, or
lower alkylphenyl;
$-COOR_3$ is a carboxylic acid group, a physiologically acceptable carboxylic acid ester group, or a physiologically acceptable carboxylate salt group;
R_4 is hydrogen or lower alkoxy having 1 to 4 carbon atoms;
X is SO in the S-configuration or is SO_2; and
A is hydrogen, halogen, or $-CH_2Y$ wherein
Y is a nucleophilic group which is aliphatic carbonyloxy, hydroxy, alkoxy having 1 to 8 carbon atoms, pyridino, quinolino, isoquinolino, such pyridino, quinolino, or isoquinolino substituted by
lower alkyl
lower alkoxy, or by
carbamyl, carbamyloxy, carbamylthio, such carbamyloxy or carbamylthio monosubstituted or disubstituted on the nitrogen atom by lower alkyl or by alkylene forming a 5- or 6-membered ring with the nitrogen atom, which ring may be interrupted by a further oxygen, sulfur, or nitrogen atom,
or Y is $-SR_5$ wherein
R_5 is aliphatic carbonyl having 1 to 4carbon atoms, benzoyl, toluoyl, a 5-membered heteroaromatic ring wherein 1 ring member is sulfur or oxygen and 1 to 3 further ring members are nitrogen and the remaining ring members are carbon or wherein 2 to 4 ring members are nitrogen and the remaining ring members are carbon, such a 5-membered heteroaromatic ring fused to a benzene ring, or such a 5-membered heteroaromatic ring or 5-membered heteroaromatic ring fused to a benzene ring wherein said 5-membered heteroaromatic ring is substituted by
lower alkenyl,
amino,
carboxy,
carboxy lower alkylthio,
cyano lower alkylthio,
lower alkoxy carbonyl lower alkylthio,
sulfonyl lower alkylthio,
pyridyl-N-oxide
hydroxy
cycloalkyl having 3 to 8 carbon atoms,
phenylamino,
carboxy lower alkanoylamino,
pyridyl,
pyridyl lower alkyl,
lower alkanoylamino,
lower alkanoyl lower alkylamino,
carbamyl,
carbamyl lower alkyl,
morpholinyl carbonyl,
phenyl,
halophenyl,
lower alkoxyphenyl,
lower alkylphenyl,
hydroxyphenyl,
sulfamylphenyl,
lower alkyl, or
lower alkyl substituted by
carboxy,
sulfonyl,
sulfamyl,
phenyl,
halophenyl,
carbamyl,
lower alkyl carbamyl,
lower alkoxy carbonyl,
halogen,
amino,
lower alkanoylamino,
hydroxy,
cyano,
lower alkoxy,
carboxy lower alkoxy,
carbamyl lower alkoxy,
lower alkoxy carbamyl lower alkoxy, or
phenoxy,
or wherein said 5-membered heteroaromatic ring is substituted by
a further 5-membered ring containing at least one oxygen, sulfur, or nitrogen atom as a hetero atom or is such a further 5-membered ring substituted by
nitro,
carbamyl, or

carboxy,
or wherein
R_5 is a 6-membered heteroaromatic ring wherein 1 to 4 ring members are nitrogen and the remaining ring members are carbon, such a 6-membered heteroaromatic ring fused to a benzene ring, such a 6-membered heteroaromatic ring fused to a further 5-membered or 6-membered heteroaromatic ring wherein 1 to 3 ring members are nitrogen and the remaining ring members are carbon, or such 6-membered heteroaromatic ring or 6-membered heteroaromatic ring fused to benzene or to a further heteroaromatic ring wherein said 6-membered heteroaromatic ring is substituted by
carboxy lower alkoxy,
carboxy lower alkylthio,
lower alkoxy carbonyl lower alkylthio,
hydroxy,
lower alkoxy,
lower alkoxy carbonyl lower alkoxy,
carboxy,
nitro,
halogen,
lower alkoxy carbonyl,
phenyl,
lower alkylthio,
amino,
morpholino,
morpholinyl carbonyl,
lower alkyl, or
lower alkyl substituted by
carboxy,
lower alkoxy carboxy,
carbamyl, or
cyano.

8. A pharmaceutical composition for the treatment of bacterial infections comprising an effective amount of a cephem compound as in claim 1 together with a pharmaceutically acceptable carrier.

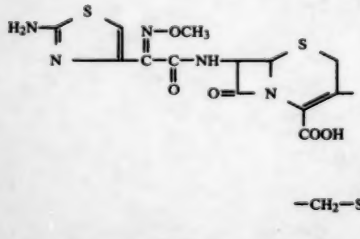
4,399,132

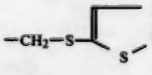
7-BETA-[ALPHA-SYN-METHOXYIMINO-ALPHA-(2-AMINOTHIAZOL-4-YL)-ACETAMIDO]-3-[(1,2,3-THIADIAZOL-5-YLTHIO)METHYL]-3-CEPHEM-4-CARBOXYLIC ACID AND C_1–C_6 ALKYL DERIVATIVES THEREOF

William V. Curran, Pearl River, and Adma S. Ross, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 176,889, Aug. 11, 1980, abandoned. This application Jul. 8, 1981, Ser. No. 281,438
Int. Cl.³ A61K *31/545;* **C07D** *501/56*
U.S. Cl. 424—246 **9 Claims**

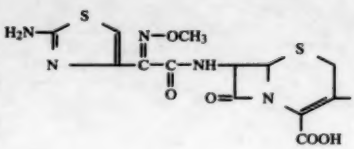
1. A compound selected from those of the formula:

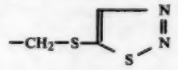




wherein R is selected from the group consisting of hydrogen and R_1, wherein R_1 is C_1–C_6 alkyl; and the pharmaceutically acceptable nontoxic cation salts thereof.

7. A composition of matter which comprises an effective amount of a compound of the formula:





wherein R is selected from the group consisting of hydrogen and R_1 wherein R_1 and C_1–C_6 alkyl, and the pharmaceutically acceptable nontoxic cationic salts thereof, in association with a pharmaceutically acceptable carrier.

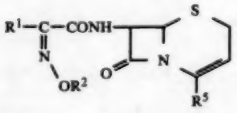
4,399,133

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyoshi Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Division of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 15, 1981, Ser. No. 302,613
Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78
Int. Cl.³ C07D *501/22;* **A61K** *31/545*
U.S. Cl. 424—246 **7 Claims**

1. A syn compound of the formula:



wherein
R^1 is thiadiazolyl,
R^2 is hydrogen or aliphatic hydrocarbon which may be substituted with halogen, carboxy or esterified carboxy and
R^5 is carboxy or carboxy modified to a group from which carboxy may be regenerated, and pharmaceutically acceptable salt thereof.

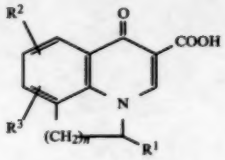
4,399,134

PYRROLOQUINOLINE AND BENZOQUINOLIZINE COMPOUNDS AND ANTIMICROBIAL COMPOSITIONS

Hiroshi Ishikawa; Testuyuki Uno; Masanobu Kano, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

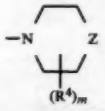
Filed Nov. 10, 1981, Ser. No. 320,027
Claims priority, application Japan, Nov. 10, 1980, 55-158652; Apr. 24, 1981, 56-63170
Int. Cl.³ A61K *31/47;* **C07D** *455/02*
U.S. Cl. 424—246 **23 Claims**

1. A benzoheterocyclic compound of the formula (I)



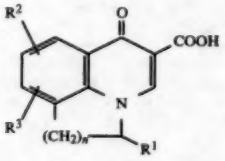
(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a hydrogen atom or a halogen atom; R^3 represents a 1-pyrrolidinyl group which may be substituted with a hydroxymethyl group, a 1,2,5,6-tetrahydro-1-pyridyl group, or a group of the formula



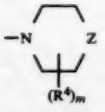
where R^4 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a hydroxy group, a phenyl-lower alkyl group, a lower alkanoyloxy group, an amino group which may be substituted with a lower alkyl group or a lower alkanoyl group, an oxo group, or a carbamoyl group; Z represents an oxygen atom, a sulfur atom or a methylene group; and m is 1 or 2; and n is an integer of 1 or 2; or its pharmaceutically acceptable salt.

23. An antibacterial composition comprising an antibacterially effective amount of a benzoheterocyclic compound of the formula (I)



(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a hydrogen atom or a halogen atom; R^3 represents a 1-pyrrolidinyl group which may be substituted with a hydroxymethyl group, a 1,2,5,6-tetrahydro-1-pyridyl group, or a group of the formula



where R^4 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a hydroxy group, a phenyl-lower alkyl group, a lower alkanoyloxy group, an amino group which may be substituted with a lower alkyl group or a lower alkanoyl group, an oxo group, or a carbamoyl group; Z represents an oxygen atom, a sulfur atom or a methylene group; and m is 1 or 2; and n is an integer of 1 or 2; or its pharmaceutically acceptable salt, as an active ingredient and a pharmaceutically acceptable carrier.

4,399,135

OXACEPHALOSPORINS AND ANTI-BACTERIAL COMPOSITION CONTAINING SAME

Daniel Farge; Pierre L. Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson; Bernard Plau, Creteil, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

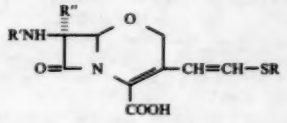
Filed Nov. 19, 1981, Ser. No. 322,962

Claims priority, application France, Nov. 20, 1980, 80 24639

Int. Cl.³ A61K *31/535*; C07D *498/04*

U.S. Cl. 424—248.51 **5 Claims**

1. A oxacephalosporin of the general formula:



in which the symbol R is chosen from amongst:

(1) optionally N-oxidised pyrid-2-yl, pyrid-3-yl or pyrid-4-yl,

(2) pyrimidin-2-yl,

(3) 6-methylpyridazin-3-yl-1-oxide,

(4) 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 4-position by

(a) an alkyl radical containing 1 or 2 carbon atoms, which is optionally substituted by an alkoxy, alkylthio or formyl radical,

(b) an allyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl or 2-formyl-2-hydroxyethyl radical, or

(c) an alkyl radical containing 2 or 3 carbon atoms, which is substituted by hydroxyl, carbamoyloxy, acyloxy or acylamino (the acyl portions of which are unsubstituted or substituted by amino), alkylsulphonylamino, ureido, alkylureido or dialkylureido,

(5) 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, or 5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 2-position, by an alkyl radical containing 1 or 2 carbon atoms, which is optionally substituted by a formyl radical,

(6) 2-alkyl-2,5-dihydro-5-oxo-1,2,4-triazin-3-yl optionally substituted in the 6-position by an alkyl or alkoxy radical, the alkyl portions and radicals of which contain 1 or 2 carbon atoms,

(7) 1-amino-1,2-dihydro-2-oxopyrimidin-4-yl,

(8) 1,3,4-thiadiazol-5-yl substituted by alkyl, dialkylaminoalkyl or acylaminoalkyl,

(9) tetrazol-5-yl substituted in the 1-position by

(a) an alkyl radical containing 1 or 2 carbon atoms, which is optionally substituted by a formyl radical,

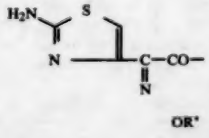
(b) an alkyl radical containing 2 or 3 carbon atoms, which is substituted by hydroxyl, acylamino or dialkylamino, or

(c) a 2,3-dihydroxypropyl or 1,3-dihydroxyprop-2-yl radical, or

(10) (a) 1-alkyl-1,2,4-triazol-5-yl optionally substituted in the 3-position by an alkoxycarbonyl radical, the alkyl and alkoxy radicals of which contain 1 or 2 carbon atoms, or

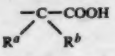
(b) 1-alkyl-1,3,4-triazol-5-yl,

the symbol R' represents a radical of the general formula:



in which R' is a hydrogen atom, an alkyl radical, a vinyl radi-

cal or a carboxyalkyl radical represented by the general formula:



in which the radicals R^a and R^b, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, or R′ represents an α-carboxyarylacetyl radical in which aryl is a phenyl radical (optionally substituted by a p-hydroxy radical) or a thien-2-yl or thien-3-yl radical, and the symbol R″ represents a hydrogen atom or a methoxy radical in the 7α-position, it being understood that, unless otherwise mentioned, the abovementioned alkyl or acyl radicals and portions are linear or branched and contain 1 to 4 carbon atoms, in its E or Z forms and mixtures thereof, if appropriate in its syn or anti forms or mixtures thereof, and also its pharmaceutically acceptable metal salts, its addition salts with pharmaceutically acceptable nitrogen-containing bases and, its addition salts with pharmaceutically acceptable acids.

5. A pharmaceutical antibacterial composition which contains an antibacterial amount of at least one product according to claim 1, in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,399,136

PYRAZOLOPYRIDAZINE ANTIHYPERTENSIVES

Cedric H. Hassall, Harpenden; Geoffrey Lawton, Hitchin, and Christopher J. Moody, Stevenage, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

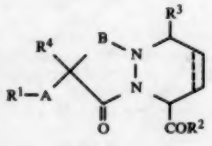
Filed Jun. 10, 1981, Ser. No. 272,351

Claims priority, application United Kingdom, Jun. 13, 1980, 8019342; Mar. 11, 1981, 8107621

Int. Cl.³ A61K *31/50;* **C07D** *487/04, 237/04, 487/14*

U.S. Cl. 424—250 **19 Claims**

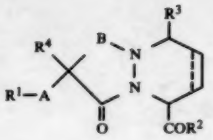
1. A compound of the formula



I

wherein A is methylene, ethylene or propylene which may be substituted by lower alkyl, B is carbonyl or methylene, R^1 is halogen, carboxyl, lower alkoxycarbonyl, hydroxyaminocarbonyl, mercapto, lower alkanoylthio or aryl-(lower alkylthio)-, R^2 is hydroxy, lower alkoxy or amino, R^3 is hydrogen, lower alkyl, aryl or aryl-(lower alkyl)-, R^4 is hydrogen, lower alkyl, aryl or aryl-(lower alkyl)- or a group of the formula -A-R^1 wherein A and R^1 are as described above and the broken line denotes an optional carbon-carbon bond which can be present only when B is carbonyl, or a salt of a compound of formula I, wherein R^1 is carboxy and/or R^2 is hydroxy, with a pharmaceutically acceptable base.

15. A method of controlling or preventing hypertension which comprises administering to a host requiring such treatment a pharmaceutical composition containing an effective amount of a compound of the formula



I

wherein A is methylene, ethylene or propylene which may be substituted by lower alkyl, B is carbonyl or methylene, R^1 is halogen, carboxyl, lower alkoxycarbonyl, hydroxyaminocarbonyl, mercapto, lower alkanoylthio or aryl-(lower alkylthio)-, R^2 is hydroxy, lower alkoxy or amino, R^3 is hydrogen, lower alkyl, aryl or aryl-(lower alkyl)-, R^4 is hydrogen, lower alkyl, aryl or aryl-(lower alkyl)- or a group of the formula -A-R^1 wherein A and R^1 are as described above and the broken line denotes an optional carbon-carbon bond which can be present only when B is carbonyl, or a salt of a compound of formula 1, wherein R^1 is carboxy and/or R^2 is hydroxy, with a pharmaceutically acceptable base.

4,399,137

6-IMIDAZOL-1-YL-3-HYDRAZINO-PYRIDAZINES, THEIR PREPARATION AND ANTIHYPERTENSIVE USE

Gerd Steiner, Kirchheim; Josef Gries, Wachenheim, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 176,018, Aug. 7, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,374

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935359

Int. Cl.³ C07D *403/04;* **A61K** *31/50*

U.S. Cl. 424—250 **5 Claims**

1. 3-Hydrazino-6-(2-methyl-imidazol-1-yl)-pyridazine.

2. 3-Hydrazino-6-(2-ethyl-imidazol-1-yl)-pyridazine.

3. 3-(2-Isopropylidene-hydrazino)-6-(2-methyl-imidazol-1-yl)-pyridazine.

4. 3-(2-Isopropylidene-hydrazino)-6-(2-ethyl-imidazol-1-yl)-pyridazine.

5. A therapeutic agent for the treatment of hypertonia which comprises an effective amount of a compound of claim 1, 2, 3 or 4 or a physiologically tolerated additional salt thereof with an acid for lowering blood pressure combined with a pharmaceutically acceptable excipient and/or diluent.

4,399,138

ALKANOLAMINE DERIVATIVES

Jeffrey J. Barlow, Stockport, and Leslie H. Smith, Cheadle, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 2, 1982, Ser. No. 344,969

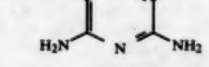
Claims priority, application United Kingdom, Feb. 2, 1981, 8103131

Int. Cl.³ C07D *241/16, 241/26;* **A61K** *31/495*

U.S. Cl. 424—250 **7 Claims**

1. An alkanolamine compound of the formula:

Ar—OCH_2.CHOH.CH_2—NH—A^1—NHCO—



wherein

Ar is phenyl or naphthyl which is unsubstituted or which bears one or two substituents selected from halogen, trifluoromethyl, hydroxy, amino, nitro, carbamoyl, carbamoylmethyl and cyano, and alkyl, alkenyl, alkoxy, alkenyloxy,

alkylthio, alkanoyl and alkanoylamino each of up to 6 carbon atoms, or Ar is 4-indolyl, 4-benzo[b]thienyl, 5-benzo[1,4]dioxanyl, 4- or 5-indanyl, 5- or 6-(1,2,3,4-tetrahydronaphthyl), 2,3-dihydroxy-1,2,3,4-tetrahydronaphth-5yl or 4-morpholino-1,2,5-thiadiazol-3-yl;

wherein R is halogen;

wherein A^1 is alkylene of 2 to 6 carbon atoms; and

wherein A^2 is alkylene of 1 to 7 carbon atoms which is unsubstituted or bears a phenyl, hydroxy or carbamoyl substituent, or A^2 is cycloalkylene of 3 to 6 carbon atoms;

or an acid-addition salt thereof.

4,399,139

5,6-DIHYDRO-11-ALKYLENE-MORPHANTHRIDIN-6-ONES, THEIR PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Gerd Steiner, Kirchheim; Ludwig Friedrich, Bruehl, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

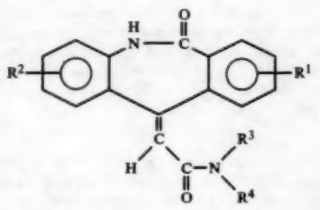
Filed Mar. 19, 1982, Ser. No. 359,936

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113094

Int. Cl.³ A61K *31/55;* **C07D** *403/06*

U.S. Cl. 424—250 **6 Claims**

1. A 5,6-dihydro-11-alkylene-morphanthridin-6-one of the formula I



I

where R^1 and R^2 are hydrogen, chlorine or methyl and R^3 and R^4 together with nitrogen atom by which they are linked form a piperazine ring in which the carbon atoms are unsubstituted or substituted by one or more alkyl radicals of 1 to 3 carbon atoms and the nitrogen atom is substituted by alkyl of 1 to 3 carbon atoms, hydroxylalkyl of 2 or 3 carbon atoms or phenyl which is itself unsubstituted or substituted by fluorine, chlorine, methoxy or methyl, or is in the form of the N-oxide, and/or its physiologically tolerated acid addition salts.

6. A process for treating disorders which are accompanied by pathologically increased gastric secretion which comprises: administering to the patient to be treated a composition as set forth in claim 1 in an amount sufficient to provide a daily dose of a compound of the formula I of from 5 to 100 mg.

4,399,140

5-HALO-PYRIMIDIN-2-ONES, THE SALTS THEREOF

Mikkel Gacek, and Kjell Undheim, both of Oslo, Norway, assignors to Nyegaard & Co. A/S, Norway

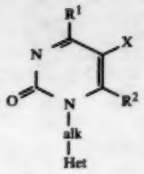
Filed Jan. 6, 1981, Ser. No. 222,959

Claims priority, application United Kingdom, Jan. 7, 1980, 8000381

Int. Cl.³ A61K *31/505;* **C07D** *401/06, 403/06, 405/06*

U.S. Cl. 424—251 **10 Claims**

1. A compound of the formula:



wherein

X represents a halogen atom;

R^1 and R^2, which may be the same or different, each represents a hydrogen atom or a C_{1-4} alkyl group;

Het represents a C-attached 3–7 membered heterocyclic ring containing one or two heteroatoms selected from O, N and S and optionally carrying a fused ring and/or optionally carrying one or more substituents selected from the group consisting of halogen atoms and hydroxy, C_{1-4} alkoxy, amino, C_{1-4} alkylamino, C_{7-20} aralkylamino, C_{6-10} arylamino, C_{1-4} alkanoylamino, nitro, oxo, C_{1-4} alkyl groups and C_{1-4} alkyl substituted with carboxy, C_{1-4} alkyl esterified carboxy or amido groups; and monocyclic carbocyclic groups; said heterocyclic ring being saturated and having only a single heteroatom when there are 3 or 4 ring members and being unsaturated or aromatic when there are 5–7 ring members;

alk represents a C_{1-4} alkylene or alkenylene group optionally substituted by a group selected from the group consisting of phenyl and 5 or 6 membered heterocyclic groups containing one or two heteroatoms selected from O, N or S;

and where an acidic or basic group is present, the salts thereof.

9. Pharmaceutical compositions for combatting abnormal cell proliferation comprising as active ingredient an effective amount of a compound of formula I as defined in claim 1 or, where an acidic or basic group is present, a physiologically compatible salt thereof in association with a pharmaceutical carrier or excipient.

4,399,141

5-ALKYL OR HYDROXYALKYL SUBSTITUTED-10,11-DIHYDRO-5H-DIBENZO[a,d]CYCLOHEPTEN-5,10-IMINES AND ANTICONVULSANT USE THEREOF

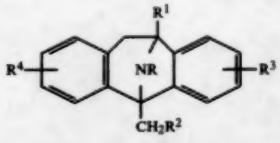
Paul Anderson, Lansdale; Marcia E. Christy, Perkasie, and Ben E. Evans, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 74,367, Sep. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 912,772, Jun. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,639, Sep. 19, 1977, abandoned. This application Jun. 12, 1981, Ser. No. 272,864

Int. Cl.³ A61K *31/435;* **C07D** *455/00*

U.S. Cl. 424—256 **18 Claims**

1. A compound of the structural formula



or a pharmaceutically acceptable salt thereof wherein:

R is

(1) hydrogen,

(2) C_{1-5} alkyl,

(3) C_{2-5} alkenyl,

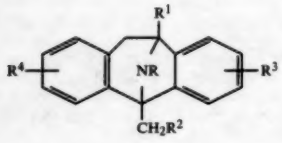
(4) phenyl-C_{1-3} alkyl,
(5) halophenyl-C_{1-3} alkyl,
(6) C_{1-3} alkylphenyl-C_{1-3} alkyl,
(7) C_{3-6} cycloalkyl,
(8) C_{3-6} cycloalkyl-C_{1-3} alkyl,
(9) di(C_{1-3} alkyl)amino-C_{1-3} alkyl; or
(10) hydroxy;

R^1 is
(1) hydrogen,
(2) C_{1-5} alkyl,
(3) C_{2-5} alkenyl,
(4) phenyl-C_{1-3} alkyl,
(5) C_{3-6} cycloalkyl
(6) C_{3-6} cycloalkyl-C_{1-3} alkyl;

$-CH_2R^2$ is
(1) methyl,
(2) ethyl or
(3) hydroxyethyl; and

R^3 and R^4 are independently
(1) hydrogen,
(2) halogen,
(3) C_{1-5} alkoxy,
(4) trifluoromethylthio,
(5) cyano,
(6) carboxy, or
(7) hydroxy.

13. A method of treating convulsions, comprising administering to a patient in need of such treatment an effective anticonvulsant amount of a compound of structural formula:



or a pharmaceutical acceptable salt thereof wherein:

R is
(1) hydrogen,
(2) C_{1-5} alkyl,
(3) C_{2-5} alkenyl,
(4) phenyl-C_{1-3} alkyl,
(5) halophenyl-C_{1-3} alkyl,
(6) C_{1-3} alkylphenyl-C_{1-3} alkyl,
(7) C_{3-6} cycloalkyl,
(8) C_{3-6} cycloalkyl-C_{1-3} alkyl,
(9) di(C_{1-3} alkyl)amino-C_{1-3} alkyl; or
(10) hydroxy;

R^1 is
(1) hydrogen,
(2) C_{1-5} alkyl
(3) C_{2-5} alkenyl,
(4) phenyl-C_{1-3} alkyl,
(5) C_{3-6} cycloalkyl,
(6) C_{3-6} cycloalkyl-C_{1-3} alkyl;

$-CH_2R^2$ is
(1) methyl,
(2) ethyl or
(3) hydroxyethyl; and

R^3 and R^4 are independently
(1) hydrogen,
(2) halogen,
(3) C_{1-5} alkoxy,
(4) trifluoromethylthio,
(5) cyano,
(6) carboxy, or
(7) hydroxy.

4,399,142

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Oodicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

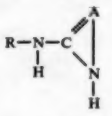
Division of Ser. No. 239,238, Mar. 3, 1981, Pat. No. 4,341,787, which is a division of Ser. No. 60,324, Jul. 25, 1979, Pat. No. 4,282,221, which is a division of Ser. No. 893,859, Apr. 6, 1978, Pat. No. 4,181,730, which is a division of Ser. No. 736,662, Oct. 29, 1976, Pat. No. 4,104,381, which is a division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Mar. 31, 1982, Ser. No. 364,134

Claims priority, application United Kingdom, May 3, 1973, 2106373; Jul. 26, 1973, 35551/73

Int. Cl.³ A61K *31/47*

U.S. Cl. 424—258 **5 Claims**

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a quinazoline or quinoline ring, said ring having a keto, thione or sulfone group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is a nitrogen containing heterocyclic ring selected from imidazole, thiazole, isothiazole or thiadiazole, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,399,143

PHENOXYBUTYLTRIAZOLE COMPOUND, AGRICULTURAL AND HORTICULTURAL FUNGICIDAL COMPOSITION CONTAINING THE SAME, AND PROCESS FOR PRODUCING THE SAME

Isao Yokomichi, Moriyama; Takahiro Haga, Kusatsu; Terumasa Komyoji, Moriyama; Toshio Nakajima, Kusatsu, and Norifusa Matsuo, Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

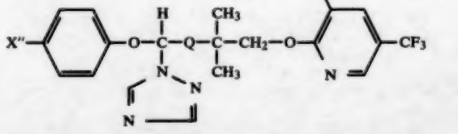
Filed Sep. 25, 1981, Ser. No. 305,676

Claims priority, application Japan, Sep. 25, 1980, 55-133538

Int. Cl.³ A01N *43/64*; C07D *401/12, 401/14, 249/08*

U.S. Cl. 424—263 **14 Claims**

1. A phenoxybutyltriazole compound represented by the following formula (III):

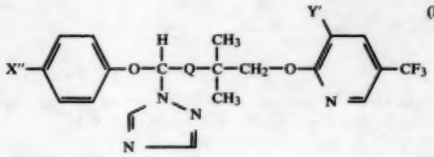


(III)

wherein X″ is a halogen atom; Y′ is a hydrogen atom or a

halogen atom; and Q is a >C=O group or a >CH—OH group, or a salt thereof.

8. An agricultural fungicidal composition which comprises a phenoxybutyltriazole compound or a salt thereof as an active ingredient and an agriculturally and horticulturally acceptable adjuvant, said phenoxybutyltriazole compound being represented by the following formula (III):



(III)

wherein X'' is a halogen atom; Y' is a hydrogen atom or a halogen atom; and Q is a >C=O group or a >CH—OH group, or a salt thereof.

4,399,144
PYRIDINIUM SALTS

Roger Crossley, Reading, England, assignor to John Wyeth and Brother Limited, Maidenhead, England

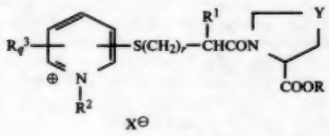
Division of Ser. No. 254,801, Apr. 16, 1981, Pat. No. 4,331,673. This application Jan. 25, 1981, Ser. No. 342,542

Claims priority, application United Kingdom, Apr. 30, 1980, 8014281

Int. Cl.³ A61K *31/44*; C07D *417/12*

U.S. Cl. 424—263 **4 Claims**

1. A compound of formula



(I)

wherein the sulphur is bonded to the pyridinium ring at position 2 or 4, Y is —S—, R represents hydrogen or lower alkyl group; R^1 represents hydrogen or lower alkyl; R^2 represents lower alkyl, aryl of 6 to 10 carbon atoms or aralkyl of 7 to 11 carbon atoms; R^3 represents hydrogen or a substituent selected from lower alkyl, halogen and lower alkoxy; q and r are each 1 or 2; and $X^{\ominus}$ represents a halide ion or p-toluenesulphonate or methanesulphonate.

4. A pharmaceutical composition comprising an anti-hypertensive effective amount of a compound of formula I as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,399,145
LACTAMS COMPOSITIONS AND PHARMACEUTICAL METHODS OF USE

Ivars Graudums, and Elmar Friderichs, both of Stolberg, Fed. Rep. of Germany, assignors to Grunenthal GmbH, Stolberg, Fed. Rep. of Germany

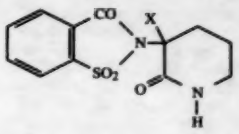
Filed Nov. 5, 1981, Ser. No. 318,389

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048663

Int. Cl.³ A61K *31/445*; C07D *417/04*

U.S. Cl. 424—267 **15 Claims**

1. A compound of the formula I



(I)

wherein X represents a straight or branched alkyl radical with 1 to 4 carbon atoms.

5. A pharmaceutical sedating-tranquilizing, hypno-anesthetic and anticonvulsant composition comprising a biologically acceptable carrier and a therapeutically effective amount of a compound of any one of claims 1, 2, or 3.

4,399,146
TREATMENT OF ATHEROSCLEROSIS WITH KHELLIN-RELATED FUROCHROMONES

Paul E. Schurr, Portage, and Charles E. Day, Fulton, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 11,815, Feb. 13, 1979, Pat. No. 4,281,013. This application Jan. 28, 1980, Ser. No. 116,321

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ A61K *31/35*

U.S. Cl. 424—283 **1 Claim**

1. A method of treating a mammal suffering from or susceptible to the development of an atherosclerotic disease which comprises:

administering systemically to said mammal an amount of a khellin-related furochromone product extracted from the plant Ammi visnaga effective either to

(a) significantly reduce levels of serum betalipoproteins, or

(b) selectively enhance levels of serum alphalipoproteins

with the proviso that said khellin-related product is other than khellin or khellinin.

4,399,147
PROSTAGLANDIN 12 ANALOGUES AND THEIR PHARMACEUTICAL COMPOSITIONS

Masaki Hayashi, Takatsuki; Yoshinobu Arai, Toyonaka; Yoshitaka Konishi; Katsuichi Shimoji, both of Takatsuki; Shuichi Ohuchida, Kyoto; Hirohisa Wakatsuka, Takatsuki, and Hiroyuki Ito, Suita, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Japan

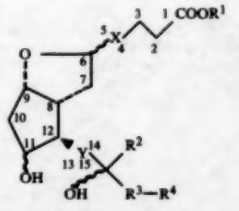
Filed Jan. 26, 1978, Ser. No. 872,635

Claims priority, application Japan, Jan. 31, 1977, 52008751

Int. Cl.³ A61K *31/557*; C07D *307/935*

U.S. Cl. 424—285 **13 Claims**

1. A prostaglandin analog of the formula:



II

wherein X represents the trans-vinylene group, y represents the trans-vinylene group or the ethylene group, R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^2 represents a hydrogen atom or a methyl or ethyl group, R^3 represents a single bond or a straight- or branched-chain alkylene group containing from 1 to 4 carbon atoms, R^4 represents a hydrogen atom,

a straight- or branched-chain alkyl group containing from 1 to 8 carbon atoms, a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one straight- or branched-chain alkyl group containing from 1 to 8 carbon atoms, or a phenyl or phenoxy group unsubstituted or carrying at least one substituent selected from halogen atoms, the trifluoromethyl group and alkyl groups containing from 1 to 3 carbon atoms, and the wavy line ~~ attached to the carbon atoms in positions 6, 11 and 15 depicted in the formula represents α- or β-configuration or mixtures thereof, cyclodextrin clathrates thereof and, when R^1 represents a hydrogen atom, non-toxic salts thereof.

8. A pharmaceutical composition for the treatment of hypertension which comprises, as active ingredient, an effective amount of at least one prostaglandin analog as claimed in claim **1**, or a cyclodextrin clathrate of such a prostaglandin analog, or when R^1 in the general formula depicted in claim **1** represents a hydrogen atom—a non-toxic salt of such a prostaglandin acid, in association with a pharmaceutical carrier or coating.

4,399,148

HYDROXYARYLALKYLENEAMINOARYL CARBAMATES AND DERIVATIVES THEREOF USEFUL AS INSECTICIDAL COMPOSITIONS

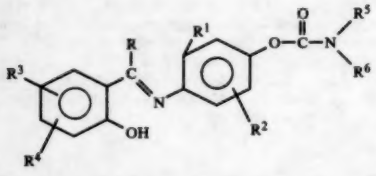
Charles A. Wilson, II, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 25, 1981, Ser. No. 247,369

Int. Cl.[3] **C07C** *125/067*; **A01N** *47/22*

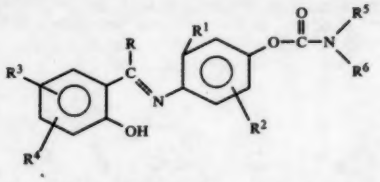
U.S. Cl. 424—285 **90 Claims**

1. A compound of the formula:



wherein R and R^1 are individually hydrogen or alkyl; R^2 is hydrogen, halo, alkyl, alkoxy, alkenyl, alkylthioalkyl or alkenyloxy provided that when R^1 and R^2 are individually alkyl or alkoxy and located adjacent to each other, then R^1 and R^2 together may form a three-to-five membered bridge consisting of carbon atoms or carbon and oxygen atoms in which the carbon atoms may be optionally substituted with alkyl and provided further that when the bridge consists of four carbon atoms, the resulting six-membered ring may optionally be aromatic or substituted aromatic; R^3 and R^4 are individually hydrogen, halo, nitro, cyano, hydroxy, unsubstituted or aliphatically substituted phenyl or phenoxy, alkyl, alkoxy, alkylcarbamoyloxy or alkylthio provided that when R^3 and R^4 are individually alkyl and located adjacent to each other, then R^3 and R^4 together may form a three-to-five membered bridge consisting of carbon atoms in which the carbon atoms may be optionally substituted with alkyl and provided further than when the bridge consists of four carbon atoms, the resulting six-membered ring may optionally be aromatic or substituted aromatic; and R^5 and R^6 are individually hydrogen or alkyl provided that when R^5 is alkyl, then R^6 may also be alkanoyl, haloalkanoyl, haloalkylsulfenyl, dialkylaminosulfenyl, morpholinosulfenyl or either substituted or unsubstituted cycloalkylsulfenyl, cycloalkylthiosulfenyl hydroxyarylalkyleneaminoaryloxycarbonylaminosulphenyl, hydroxy arylalkylyleneamino-aryloxycarbonylaminothiosulfenyl, alkylsulfenyl, phenylsulfenyl, alkylthiosulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more fluoro, chloro, bromo, cyano, aroyl, nitro, alkyl, alkanoyl, alkoxy, phenyl, phenoxy or trihalomethyl substituents in any combination; and metal salts thereof.

61. A method of controlling insects which comprises subjecting them to an insecticidally effective amount of a compound of the formula:



wherein R and R^1 are individually hydrogen or alkyl; R^2 is hydrogen, halo, alkyl, alkoxy, alkenyl, alkylthioalkyl or alkenyloxy provided that when R^1 and R^2 are individually alkyl or alkoxy and located adjacent to each other, then R^1 and R^2 together may form a three-to-five-membered bridge consisting of carbon atoms or carbon and oxygen atoms in which the carbon atoms may be optionally substituted with alkyl and provided further that then the bridge consists of four carbon atoms, the resulting six-membered ring may optionally be aromatic or substituted aromatic; R^3 and R^4 are individually hydrogen, halo, nitro, cyano, hydroxy, unsubstituted or aliphatically substituted phenyl or phenoxy, alkyl, alkoxy, alkylcarbamoyloxy or alkylthio provided that when R^3 and R^4 are individually alkyl and located adjacent to each other, then R^3 and R^4 together may form a three-to-five-membered bridge consisting of carbon atoms in which the carbon atoms may be optionally substituted with alkyl and provided further that when the bridge consists of four carbon atoms, the resulting six-membered ring may optionally be aromatic or substituted aromatic; and R^5 and R^6 are individually hydrogen or alkyl provided that when R^5 is alkyl, then R^6 may also be alkanoyl, haloalkanoyl, haloalkylsulfenyl, dialkylaminosulfenyl, morpholinosulfenyl or either substituted or unsubstituted cycloalkylsulfenyl, cycloalkylthiosulfenyl, hydroxyarylalkyleneaminoaryloxycarbonylaminosulfenyl, hydroxyarylalkyleneaminoaryloxycarbonylaminothiosulfenyl, alkylsulfenyl, phenylsulfenyl, alkylthiosulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more fluoro, cholor, bromo, cyano, aroyl, nitro, alkyl, alkanoyl, alkoxy, phenyl, phenoxy or trihalomethyl substituents in any combination; and metal salts thereof.

4,399,149

FUNGICIDES

Pieter Ten Haken, Eastling, Near Faversham; Thomas W. Naisby, and Andrew C. G. Gray, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

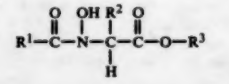
Filed Jan. 15, 1982, Ser. No. 339,350

Claims priority, application United Kingdom, Jan. 23, 1981, 8102141

Int. Cl.[3] **A61K** *31/24*

U.S. Cl. 424—309 **4 Claims**

1. A method for controlling fungi at a locus to be protected which comprises applying to the locus a fungicidal amount of a compound of the formula:



and salts thereof, wherein R^1 is hydrogen or phenyl, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl or ethyl.

4,399,150

SORBIC ACID-CONTAINING POWDER OR GRANULES

Ryuzo Ueno, Nishinomiya; Toshio Matsuda, Itami, and Shigeo Inamine, Kobe, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Division of Ser. No. 9,348, Feb. 5, 1979, Pat. No. 4,308,281, which is a continuation of Ser. No. 848,667, Nov. 4, 1977, Pat. No. 4,172,897. This application Aug. 6, 1981, Ser. No. 290,594
Claims priority, application Japan, Mar. 17, 1977, 52-28592
Int. Cl.³ A61K *31/19;* A23L *3/34*
U.S. Cl. 424—317 9 Claims

1. A readily water-soluble food preservative additive powder or granule composition consisting essentially of 5 to 90% by weight of finely divided sorbic acid having a particle diameter of 50μ or less, and 10 to 95% by weight of a normally solid water-soluble material which is an organic acid or a salt of organic acid wherein said powder or granules have a particle diameter of 300μ or more.

4,399,151

METHOD OF INHIBITING THE GROWTH OF PROTOZOA

Albert Sjoerdsma, and Peter P. McCann, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 159,973, Jun. 16, 1980, abandoned. This application May 11, 1981, Ser. No. 262,275
Int. Cl.³ A61K *31/195, 31/13, 31/70*
U.S. Cl. 424—319 16 Claims

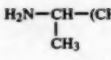
1. A method of inhibiting the growth of protozoa in animals which comprises administering a protozoal inhibiting amount of an α-substituted amino acid or an α-substituted amine having the formula

wherein

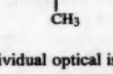
R_1 is hydrogen or carboxy;

Y is selected from the group consisting of CH_2F, CHF_2, CF_3 and C≡CH;

Z is selected from the group consisting of $H_2N-(CH_2)_3$,



and $H_2N\text{-}CH_2CH{=}CH$; with the proviso that when R_1 is hydrogen, Y cannot be CF_3 and Z must be



and the salts and individual optical isomers thereof.

4,399,152

SUBSTITUTED BENZOYL UREAS AS INSECTICIDES

Marius S. Brouwer, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International B.V., Netherlands

Continuation of Ser. No. 137,027, Apr. 3, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,484
Int. Cl.³ A01N *47/28;* C07C *127/19, 127/22*
U.S. Cl. 424—322 3 Claims

2. An insecticidal composition comprising

an insecticidally effective amount of N-(2-chlorobenzoyl)-N'-(4-trifluoromethylphenyl)urea and

a liquid or solid inert pesticide carrier.

4,399,153

COMBINATION OF FROZEN DESSERT AND STICK CHEWING GUM

Shichigoro Tezuka, Kawasaki; Yoshinori Sato, Niiza; Masaki Shibata, Tokyo, and Nobuyuki Harikae, Funabashi, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,903
Int. Cl.³ A23G *3/30, 9/04, 9/24, 9/26*
U.S. Cl. 426—5 9 Claims

1. Chewing gum, highly resistant to bending when handled and to breakage when frozen comprising a mixture of 20°–25° wt.% of a conventional gum base, 50–70% of a sweetener consisting solely of anhydrous glucose, 0.5–2 wt.% of water and the remainder an additive such as starch hydrolyzate syrup, a softening agent and flavoring, said mixture being subjected to a first aging at 18° to 20° C., at a humidity of 45–55% for 15 to 24 hours and to a second aging at −10° to −5° C. for 15 to 24 hours.

4,399,154

COEXTRUDED CHEWING GUM

Wayne J. Puglia, Bellerose Villa; Sigismondo A. DeTora, Pearl River, and Donald A. M. Mackay, Pleasantville, all of N.Y., assignors to Nabisco Brands Inc., Parsippany, N.J.

Continuation of Ser. No. 164,628, Jun. 30, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,584
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 6 Claims

1. A coextruded chewing gum having improved flavor comprising from about 40 to about 75% by weight of an extruded soft gum core portion and from about 25 to about 60% of an outer shell portion formed of chewing gum and extruded simultaneously with said core portion, said core portion formed of chewing gum containing from about 1.5% to about 2% by weight flavor based on the total weight of the coextruded chewing gum, and from about 2.2 to about 4% by weight flavor based on the weight of the core portion, said outer shell portion having a density different than the density of the chewing gum of said core portion, and containing from about 0.3 to about 1.2% by weight flavoring based on the weight of the shell portion, said shell portion being bonded by means of said coextrusion to said core portion to provide a support and protective barrier therefor to retain said flavor in said core portion and retard migration of flavor from said core portion to the outer surface of said shell portion.

4,399,155

SHORTENING REPLACING AND FRESH SLICE IMPROVING AGENTS FOR YEAST-RAISED BAKERY PRODUCTS

Curtis J. Forsythe, Pleasant Hill, Mo., assignor to Top-Scor Products, Inc., Kansas City, Kans.

Continuation-in-part of Ser. No. 962,011, Nov. 20, 1978, abandoned. This application May 4, 1981, Ser. No. 259,824
Int. Cl.³ A21D *2/14*
U.S. Cl. 426—24 4 Claims

1. A method of improving fresh slicing characteristics of yeast-raised bakery products; said bakery products being substantially free of triglyceridal shortening; said method comprising the steps of:

(a) producing a composition comprising:

(1) about 40 parts by weight sodium stearoyl-2-lactylate;

(2) about 40 parts by weight calcium stearoyl-2-lactylate; and

(3) about 20 parts by weight succinylated monoglyceride; and further

(b) incorporating said composition into the ingredients including flour and yeast of said bakery products prior to baking; wherein

(c) said composition is included in said bakery products in an amount within a range from 0.3% to about 0.5% by weight of said flour; and

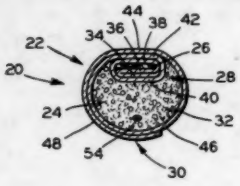
(d) baking said ingredients of said bakery products.

4,399,156

READILY PORTABLE BURRITO

Eddie L. Bernal, Defiance, Ohio, assignor to Taco Operations, Inc., Defiance, Ohio

Filed Jan. 25, 1982, Ser. No. 342,380
Int. Cl.[3] A21D *13/00*; A23L *1/00*
U.S. Cl. 426—91 15 Claims



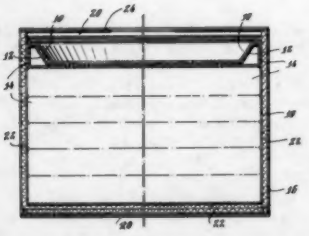
1. A portable food item comprising a tortilla, a substantially rigid and self-supporting elongate member capable of being hand held and supporting the tortilla, said elongate member having a substantial portion of its length projecting beyond an edge of said tortilla with the remaining portion of the member having an edge portion of the tortilla affixed thereto by being wrapped completely therearound from said edge portion of said tortilla toward an opposite edge portion thereof, with the remaining portion of the tortilla constituting at least one half of the tortilla forming a chamber contiguous with the wrapped portion, a food filler contained within said chamber, and said tortilla having edge portions at the ends of said chamber closed off to enclose the food filler, said tortilla being at least partially cooked and in a semi-rigid, self-sustaining state.

4,399,157

PACKAGING SYSTEM FOR FULLY BAKED, UNFILLED PASTRY SHELLS

John A. Caporaso, Hackensack, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 1, 1982, Ser. No. 344,290
Int. Cl.[3] B65D *85/36*
U.S. Cl. 426—108 7 Claims



1. A packaging system for protecting the freshness and structural integrity of a plurality of fully-baked pastry shells during shipping and storage, the system comprising:

at least one stack of paperboard cartons, each carton being an individual point of sale package, each carton containing a fully-baked, unfilled pastry shell, having a moisture content of less than about 4%, having a substantially continuous surface, and containing from about 2% to about 5% glycerol, positioned within a pan such that the combination of the shell and the pan contacts each of the internal walls of the carton to substantially limit the movement of the shell within the carton;

a bag comprised of a high polymer film surrounding the stack of paperboard cartons;

at least one layer of shock absorbing material surrounding the bag; and

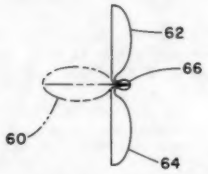
a corrugated shipping container enclosing the shock absorbing material.

4,399,158

PRESSURIZED CONTAINER PROVIDING FOR THE SEPARATE STORAGE OF A PLURALITY OF MATERIALS

Robert F. Bardsley, Harrington Park, N.J.; Thomas P. Finucane, Hartsdale, N.Y.; Carl Hebel, Dover Foxcroft, Me.; Charles D. Schoonmaker, Boonton Township, Morris County, N.J.; Philip J. Wruk, Wilton, Conn., and Edward P. Lee, deceased, late of White Plains, N.Y. by Janice N. Lee, executrix, assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 917,262, Jun. 20, 1978, abandoned.
This application Jan. 4, 1982, Ser. No. 336,838
Int. Cl.[3] B65D *25/08*
U.S. Cl. 426—112 3 Claims



1. A container arrangement for separately storing a first liquid material and a second material in a container and providing for the automatic admixing of the first and second materials upon opening of the container, comprising, a container containing said first liquid material at superatmospheric pressure, with the pressure surrounding said container being atmospheric, a separate closed compartment arranged within said container and filled with said second material, said separate compartment being formed of a unitary piece of plastic molded as a clamshell shaped compartment with a first half of the unitary piece forming a first separable component of the compartment and a second half of the unitary piece forming a second separable component of the compartment, said first and second halves being hingedly joined along a common linear hinge wall which provides an opening force to bias the first and second halves apart toward an open position of the clamshell compartment, said second material being placed in the clamshell compartment at atmospheric pressure and the clamshell compartment then being closed against the opening force of the common linear hinge wall, and the clamshell compartment then being retained in a closed position by an adhesive material adhesively joining the separable halves of said clamshell compartment, said adhesive material being soluble in the first liquid material stored in said container, said clamshell compartment being placed, after being filled with said second material and then being adhesively joined, in the first liquid material in the container and the container then being sealed and attaining said superatmospheric pressure, after which said adhesive is dissolved by said first liquid material, leaving only the pressure differential between the superatmospheric pressure inside said container and the atmospheric pressure inside of said clamshell compartment to provide a closing force to hold the separable halves closed together in a compartment-sealing condition with the closing force provided by said pressure differential being greater than the opposed, opening force provided by said common linear hinge wall such that when the pressure differential between the compartment and container is removed, responsive to opening of said container, the compart-

ment will be biased apart by the opening force provided by said linear hinge wall to empty the second material from said compartment into first liquid material in said container.

4,399,159

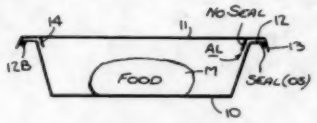
VERTABLE TRAY AND LID ASSEMBLY FOR HEATING FOODS

Raul Guibert, Los Angeles, Calif., assignor to Sunset Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 971,381, Dec. 20, 1978, Pat. No. 4,326,497, which is a division of Ser. No. 809,775, Jun. 24, 1977, Pat. No. 4,132,216, which is a continuation-in-part of Ser. No. 776,772, Mar. 11, 1977, Pat. No. 4,112,916. This application Jul. 13, 1981, Ser. No. 282,607

Int. Cl.³ B65D *51/16, 5/64*

U.S. Cl. 426—113 **7 Claims**



1. A tray and lid assembly loaded with a pre-cooked meal which rests on the tray but is out of physical contact with the lid, the loaded assembly being first placed in storage in a cooling chamber and thereafter being transferred to a heating oven to reheat the food to a serving temperature whereby in the cooling mode the meal is subjected to a temperature well below ambient temperature, and in the heating mode to a temperature well above ambient temperature, said assembly comprising:

A. an open-mouthed tray having a polygonal shape provided with side walls whose junctions form corners, said tray being fabricated of synthetic plastic material non-reactive with the meal, said tray being also provided with a continuous outwardly-extending flange which surrounds the open mouth and has a peripheral bead;

B. a lid having the same shape as the tray and fabricated of the same material, whereby the tray and lid have the same positive thermal coefficient, said lid having a continuous downwardly-extending skirt, the inner wall of the skirt having a rib thereon to define at its junction with the lid a cavity to receive the bead of the flange, the rib being interrupted at the corners to create air vents; and a continuous underside strip which at ambient temperature is received within the mouth of the tray; said lid in the cooling mode contracting to a somewhat greater extent than the loaded tray in which the meal acts as a heat sink to retard cooling of the tray to cause said strip to shift inwardly with respect to said mouth to create an air leakage path and to cause said bead to press into said cavity to create an outer seal preventing infiltration of ambient air into the assembly, said lid in the heating mode expanding to a somewhat greater extent than the loaded tray in which the meal acting as a heat sink retards heating of the tray to initially cause heated and expanding air within the tray to escape through said air leakage path and said vents, after which said strip is pressed against the sides of the tray to form an inner seal preventing the escape of volatile constituents from the meal.

4,399,160

THICKENING COMPOSITION FROM FERMENTED WHEY

Robert D. Schwartz, Concord, and Elizabeth A. Bodie, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 7, 1981, Ser. No. 290,767

Int. Cl.³ A23C *21/02;* **A23L** *1/28;* **C12P** *19/06;* **C12N** *1/20*

U.S. Cl. 426—41 **3 Claims**

1. A synergistic thickening composition of matter comprising a mixture of:

(a) from about 0.1 to about 4% by weight of a dried functionalized dairy whey product produced by a process comprising the steps of:

(1) forming a fermentation broth of whey, and yeast extract, and

(2) fermenting the broth with the organism *Xanthomonas campestris* ATCC 31923 and

(b) from about 5 to about 25% by weight of a dried functionalized dairy whey product produced by a process comprising the steps of:

(1) forming a fermentation broth of whey and sucrose; and

(2) fermenting the broth with the organism *Leuconostoc mesenteroides* ATCC 14935.

4,399,161

NOVEL METHOD OF STORING PROCESSED FISH AND ROE

Hisao Nakamura, Tokyo, and Youji Uchida, Asaka, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,434

Claims priority, application Japan, Feb. 15, 1980, 55-17246; Feb. 20, 1980, 55-19888; Feb. 21, 1980, 55-20886

Int. Cl.³ A23B *4/00;* **A22C** *25/00*

U.S. Cl. 426—541 **12 Claims**

1. A method of storing processed fish which comprises placing a fish in a gas impermeable packaging bag or an airtight container together with an oxygen absorbent and storing the same at a temperature between −10° and 10° C., said processed fish having been obtained by immersing fresh fish in brine, splitting the back or belly, or slicing the fish, and then dewatering the fish, said processed fish having a water content of 40 to 80% and a NaCl concentration of 2 to 10%.

4,399,162

DIPEPTIDE SWEETENING COMPOSITION

Yuzo Okada, Kamakura, Japan, assignor to Ajinomoto Company, Inc., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,434

Claims priority, application Japan, Mar. 19, 1980, 55-35046; Apr. 18, 1980, 55-51383

Int. Cl.³ A23L *1/236*

U.S. Cl. 426—548 **4 Claims**

1. A dipeptide sweetening composition comprising: (a) a unit weight of the methyl or ethyl ester of α- L-aspartyl-L-phenylalanine and (b) a flavoring agent in an amount sufficient to impart the tasting strength equal to that of 10 to 200 wt % of monosodium L-glutamate based on the weight of the dipeptide sweetener, said flavoring agent being monosodium glutamate optionally in the presence of at least one flavoring agent selected from the group consisting of sodium inosine-5'-phosphate, sodium guanosine-5'-phosphate and sodium aspartate.

4,399,163

BRANCHED AMIDES OF L-ASPARTYL-D-AMINO ACID DIPEPTIDES

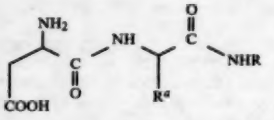
Thomas M. Brennan, Old Lyme, and Michael E. Hendrick, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 201,795, Nov. 5, 1980, which is a continuation-in-part of Ser. No. 113,800, Jan. 21, 1980, abandoned. This application Jun. 26, 1981, Ser. No. 276,243

Int. Cl.³ A23L *1/236*

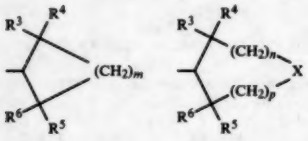
U.S. Cl. 426—548 **20 Claims**

1. An L-aspartyl-D-amino acid dipeptide amide of the formula

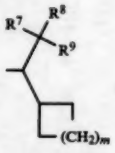


and the physiologically acceptable cationic and acid addition salts thereof, wherein R^a is CH_2OH or CH_2OCH_3; and

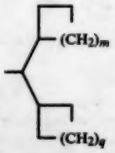
R is a branched member selected from the group consisting of fenchyl, diisopropylcarbinyl, d-methyl-t-butylcarbinyl, d-ethyl-t-butylcarbinyl, di-t-butylcarbinyl, 2-methylthio-2,4-dimethylpentan-3-yl,



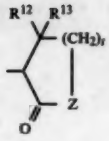
where at least one of R^3, R^4, R^5, R^6 is alkyl having from one to four carbon atoms and the remainder are hydrogen or alkyl having from one to four carbon atoms, X is O, S, SO, SO_2, C═O or CHOH; m is zero, 1, 2, 3 or 4, n and p are each zero, 1, 2 or 3 where the sum of n+p is not greater than 3 and the sum of the carbon atoms in R^3, R^4, R^5 and R^6 is not greater than six, and when both of R^3 and R^4 or R^5 and R^6 are alkyl they are methyl or ethyl,



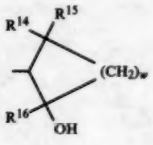
where one of R^7, R^8, R^9 is alkyl having from one to four carbon atoms and the remainder are hydrogen or alkyl having from one to four carbon atoms and the sum of the carbon atoms in R^7, R^8 and R^9 is not greater than six,



where m and q are the same or different and each have the values previously defined for m,

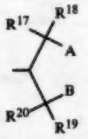


where each of R^{12} and R^{13} are methyl or ethyl, or R^{12} is hydrogen and R^{13} is alkyl having from one to four carbon atoms, Z is O or NH and t is 1 or 2,

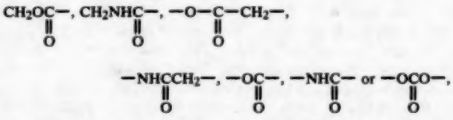


where w is 1, 2, 3 or 4, R^{14} and R^{16} are each alkyl having from one to four carbon atoms, R^{15} is hydrogen, OH, or alkyl having from one to two carbon atoms,

where the sum of the carbon atoms in R^{14}, R^{15} and R^{16} is not greater than six and when both of R^{14} and R^{15} are alkyl they are methyl or ethyl, and



where R^{17} and R^{19} are alkyl having from one to four carbon atoms, R^{18} and R^{20} are hydrogen or alkyl having from one to two carbon atoms, taken separately, A is OH and B is hydrogen, OH or methyl and when taken together A and B are



where the sum of the carbon atoms in R^{17}, R^{18}, R^{19} and R^{20} is not greater than six and when both of R^{17} and R^{18} or R^{19} and R^{20} are alkyl they are methyl or ethyl.

20. A method for sweetening edible materials which comprises adding thereto a sweetening amount of a compound according to claim **1**.

4,399,164

PREPARATION OF A DRIED BLEND OF WHEY BY-PRODUCT AND CASEIN OR ITS SALTS

Robert M. Lauck, New City, and Nicholas Melachouris, White Plains, both of N.Y., assignors to Nutrisearch Company, Cincinnati, Ohio

Division of Ser. No. 6,817, Jan. 26, 1979, Pat. No. 4,259,363, which is a continuation of Ser. No. 836,164, Sep. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,821, Dec. 17, 1976, abandoned. This application Oct. 6, 1980, Ser. No. 194,513

Int. Cl.³ A23C *21/06*; A23J *1/22*

U.S. Cl. 426—583 **2 Claims**

2. A process for preparing a dried blend of a deproteinized

whey by-product and a member selected from the group consisting of casein, sodium caseinate and potassium caseinate, said process consisting of admixing a deproteinized whey by-product solution with about 5 to 50% of said casein, sodium caseinate or potassium caseinate based on the total weight of dry solids in said whey by-product solution and drying said admixture in an atomizing dryer, said deproteinized whey by-product being selected from the group consisting of (1) the low molecular weight fraction obtained by gel fractionation of whey, (2) the permeate resulting from the ultrafiltration concentration of whey and (3) the delactosed permeate resulting from the ultrafiltration concentration of whey.

4,399,165

FRYING OIL COMPOSITION AND PROCESS OF PRODUCTION

Andre A. Tack, Izegem, and Albert J. Dijkstra, Kortrijk, both of Belgium, assignors to SAFINCO n.v., Kortrijk, Belgium

Filed Aug. 5, 1981, Ser. No. 290,201

Claims priority, application United Kingdom, Aug. 5, 1980, 8025519

Int. Cl.³ A23D *5/00, 5/02*

U.S. Cl. 426—613 **7 Claims**

4. An edible oil composition suitable for frying uses consists essentially of

(a) a liquid edible oil,

(b) an emulsifier present in an amount of 0.2 to 2 percent by weight of said composition,

(c) a browning substance present in an amount of 0.1 to 1.5 percent by weight of said composition, said browning substance being selected from the group consisting of milk powder, defatted milk powder, whey powder and dried buttermilk, and

(d) a stabilizing material in an amount effective so as to prevent or reduce the separation of the components of said composition and forming 1 weight percent or less of the total weight of said composition, said stabilizing material having a slip melting point of at least 45° C. and being selected from the group consisting of hardened rape seed oil, hardened fish oil, hardened groundnut oil and partly hardened sunflower oil.

4,399,166

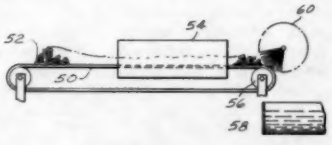
FRICTION LOCK FOR THREADS

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed Jun. 8, 1981, Ser. No. 271,531

Int. Cl.³ B05D *3/02, 1/12*

U.S. Cl. 427—195 **27 Claims**



1. The method of preparing a multiplicity of externally threaded fasteners for subsequent substantially mass heat treatment in an energy conserving operation in which substantially solid coherent deposits consisting essentially of discrete thermoplastic resin powder particles are fused, which comprises continuously advancing a series of fasteners with their axes vertical, sequentially forming deposits consisting essentially of a viscous fluid wetting agent of predetermined size and shape in the thread grooves of the fasteners as they advance, thereafter supplying thermoplastic resin powder to the surfaces of the deposits of fluid wetting agent to penetrate and form therewith fluid mixture slurry deposits substantially of the aforesaid size and shape which in cross-section fill the bottoms of the thread grooves, and extend nearly to but not beyond the thread crests, sequentially fusing the resin powder particles at the surfaces of the deposits and eliminating the fluid wetting agent thereat as the fasteners continue to advance without heating the deposits or fasteners sufficiently to produce a fused bond between the deposits and thread surfaces, cooling the deposits to cause the fused surface particles to form a non-tacky skin over the deposits, accumulating the fasteners in agglomerated condition and retaining them until enough have been accumulated for economical mass heat treatment to fuse the resin to the thread surface.

4,399,167

METAL COATING OF ABRASIVE PARTICLES

Noel J. Pipkin, 24 Mackenzie St., Florida Park, Roodepoort, Transvaal, South Africa

Continuation of Ser. No. 17,721, Mar. 5, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 233,882

Claims priority, application South Africa, Mar. 9, 1978, 78/1390

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—217 **8 Claims**

1. A method of metal coating diamond or cubic boron nitride particles, the metal being selected from the group consisting of titanium, manganese, chromium, vanadium, tungsten, molybdenum and niobium and being capable of forming a chemical bond with the particles, including the steps of providing a mass of metal for the coating in powdered form, of particle size in the range 125 to 37 microns and without having been subjected to an oxidation treatment, in contact with the particles so as to form a mixture consisting essentially of metal powder and the diamond or cubic boron nitride particles, with the metal powder present in a greater volume than the particles and with the particles being substantially uniformly distributed through the mass of metal powder, heat treating the metal powder and the particles in a non-oxidizing atmosphere at a temperature below the melting point of the metal by elevating the temperature of the powdered metal and the particles and maintaining the elevated temperature for a period of time sufficient to produce a loosely sintered mass and to allow the metal to deposit onto the particles and chemically bond thereto, and thereafter breaking up the loosely sintered mass and separating the metal-coated abrasive particles from the remaining metal particles.

4,399,168

METHOD OF PREPARING COATED CEMENTED CARBIDE PRODUCT

Gregor H. Kullander, Älvsjö; Christopher G. Chatfield, Stockholm; Marian Mikus, Skärholmen, and Bo K. Westergren, Högersten, all of Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Continuation of Ser. No. 113,751, Jan. 21, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,473

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—255.7 **2 Claims**

1. Method of treating a cemented carbide substrate containing at least one carbide together with binder metal in order to improve its wear resistance and utility, which method consists essentially of the sequential steps of:

(a) treating the substrate in an atmosphere selected from carbide, nitride and carbonitride forming atmospheres to form or apply a coating essentially comprising at least one coat of at least one member selected from the group consisting of carbides, nitrides and carbonitrides of the elements Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B;

(b) heat treating the coated substrate at a temperature close to or greater than the melting point of the binder phase in order to diffuse elements away from the substrate into said coating and from the coating into the substrate and to form a microrough surface on the substrate;

(c) treating the substrate from step (b) in an atmosphere selected from carbide, nitride and carbonitride forming

atmospheres to form or apply a second coating essentially comprising at least one member selected from the group consisting of carbides, nitrides and carbonitrides of the elements Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B;

(d) treating the resulting substrate with a nitrogen-containing gas to nitride a portion of the second coating without detrimentally effecting the adherence of the second coating to the said substrate; and

(e) applying a wear resistant oxide coating on the thus pretreated cemented carbide substrate.

4,399,169

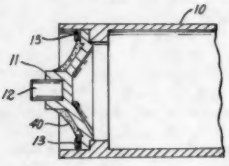
INSULATIVE END CAP FOR CYLINDRICAL METAL DRYING ROLLERS OF PAPER DRYING MACHINES, AND PROCESS FOR FABRICATION THEREOF

Paul J. McGowan, P.O. Box 576, Ludowici, Ga. 31316

Filed Jun. 22, 1981, Ser. No. 276,078

Int. Cl.³ B32B *3/02*; F26B *25/20*

U.S. Cl. 427—284 **20 Claims**



1. A process for providing surface insulation for the outer surfaces of end caps of cylindrical metal drying rollers of paper manufacturing machines, including the following steps:

(a) Applying adhesive insulative material to the outer surface of said end cap, said adhesive insulative material being capable of adhering to the outer surface of said end caps and further being capable of hardening to provide a solid layer of insulation of desired depth over said outer surface of said end cap; and

(b) Permitting said adhesive insulative material to harden to provide a solid layer of insulation of desired depth over the outer surface of said end caps.

4,399,170

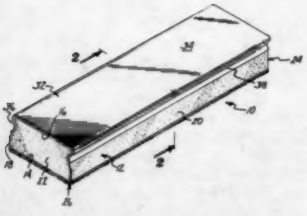
METHOD FOR SMOOTHING WALLBOARD TAPE JOINTS

Craig R. Janssen, Arden Hills, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Division of Ser. No. 232,708, Feb. 9, 1981. This application Sep. 13, 1982, Ser. No. 416,844

Int. Cl.³ B05D *1/28*; B29C *23/00*

U.S. Cl. 427—336 **4 Claims**



1. A method of smoothing wallboard joint compound on wallboard tape joint, the method comprising:

applying water to the joint to moisten the wallboard joint compound;

scrubbing the joint with a smoothing tool having resilient foam pad with a wettable abrasive surface bonded to one major surface to work the joint compound to a creamy consistency, wherein the wettable abrasive surface of the smoothing tool comprises a plurality of coarse, short, stiff synthetic polymer fibers oriented generally perpendicularly to the major surface of the pad and bonded to the major surface by an adhesive layer; and

smoothing the joint by stroking the creamy consistency joint compound with the smoothing tool.

4,399,171

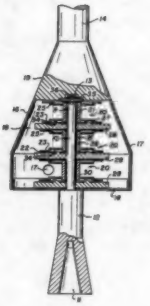
TREE DECORATION

Robert W. Murray, 969 Esquimalt Ave., West Vancouver, B.C., Canada V7T 1J9, and Paddy G. Daly, 1143 Keith Rd., West Vancouver, B.C., Canada V7J 1M7

Filed Oct. 23, 1981, Ser. No. 314,467

Int. Cl.³ A47G *33/04*

U.S. Cl. 428—7 **17 Claims**



1. A storage device for releasably storing a plurality of ribbons, comprising:

(a) a shaft;

(b) a plurality of storage units each having:

(i) a pulley independently rotatably mounted on said shaft; and

(ii) a clutch means connected between said shaft and the pulley for normally engaging therebetween so as to cause the pulley to rotate when the shaft is rotated, and for disengaging therebetween in response to a torque applied to one of said shaft and the pulley while the other one is held stationary so one can rotate while the other one is held stationary.

9. A decoration for a tree comprising:

(a) a shaft having a lower end adapted to attach to the top of the tree;

(b) a plurality of storage units each having:

(i) a pulley independently rotatably mounted on said shaft; and

(ii) a clutch means connected between said shaft and pulley for normally engaging therebetween so as to cause the pulley to rotate when the shaft is rotated, and for disengaging therebetween in response to a torque applied to one of said shaft and the pulley while the other one is held stationary so one can rotate while the other one is held stationary;

(c) a plurality of garlands each attached to the pulley of a corresponding one of said storage units.

4,399,172
ARTIFICIAL TREE CONSTRUCTION

Anthony DeCosmo, Aurora, Ill., assignor to American Technical Industries, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1982, Ser. No. 421,039
Int. Cl.³ A47G 33/06
U.S. Cl. 428—8 **6 Claims**

1. An artificial tree construction comprising a base member, an upright support column extending upwardly from the base member, a plurality of support members extending outwardly from the upper end of the support column with the column being the sole support for the support members, each of said support members being inclined downwardly and outwardly from their connection to the support column and terminating at their lower ends above said base member, a plurality of rings of progressively smaller diameter resting on said support members and vertically spaced thereon with the ring of largest diameter being at the lower extremities of the support members, artificial foliage secured to said rings and projecting radially outwardly therefrom, and a plug carrying artificial foliage carried on the upper extremity of said support column.

4,399,173
MULTILAYER FILMS COMPRISING LOW PRESSURE, LOW DENSITY POLYETHYLENE

John Anthony, Downers Grove, Ill., and Stuart J. Kurtz, Martinsville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 4, 1982, Ser. No. 336,592
Int. Cl.³ B32B 27/08, 27/32
U.S. Cl. 428—35 **8 Claims**

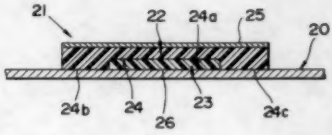
1. A multilayer film free of melt fracture comprising a core layer of low melt index, low pressure, low density polyethylene between two outer layers of a high melt index, low pressure, low density polyethylene said low melt index polyethylene having a melt index of between about 0.2 decigrams per minute and about 3.0 decigrams per minute, and said high melt index polyethylene having a melt index of greater than about 3.0 decigrams per minute.

4,399,174
REINFORCING MATERIAL

Kazunori Tanaka, Yokosuka; Yukio Nagata, Tokyo; Toshikatu Miura, Tokyo, and Yukio Okada, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 9, 1982, Ser. No. 356,451
Claims priority, application Japan, Mar. 16, 1981, 56-36572
Int. Cl.³ B32B 1/04, 3/02, 27/08
U.S. Cl. 428—67 **17 Claims**

1. A material for reinforcing a panel comprising:
a strip of expandable material which has not yet expanded;
a sheet of thermosetting resin material which has not yet hardened;
the expandable material being affixed to a central portion of the resin material so that the edges of the resin material are exposed;
one surface of the expandable material being exposed to contact the panel;
the central portion of the resin material being formed with a recess corresponding to the shape of the expandable material;

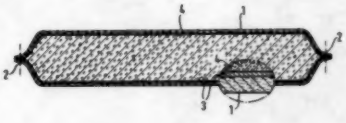


the expandable material being housed within the recess so that the surfaces of the expandable material and the resin material which contact the panel are sufficiently flat so that no gaps exist between the resin material and the panel when applied to the panel before expanding the expandable material.

4,399,175
HEAT-INSULATING BODY

Hans Kummermehr, and Günther Mohr, both of Ludwigshafen, Fed. Rep. of Germany, assignors to Grunzweig + Hartmann und Glasfaser AG, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1980, Ser. No. 166,786
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1979, 2928695
Int. Cl.³ B32B 5/16
U.S. Cl. 428—76 **4 Claims**



1. A flexible heat-insulating body comprising:
an outer porous envelope having an inner surface;
heat-insulating material in the form of a pressure-consolidated homogeneous mass on the basis of a microporous aerogel disposed within said outer porous envelope; and
a separating agent located between said inner surface of the porous envelope and the mass of heat-insulating material such that said heat-insulating material does not adhere to the outer envelope.

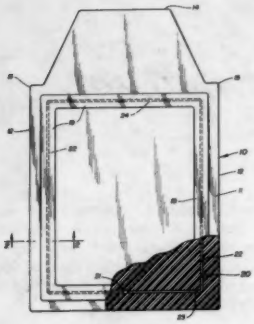
4,399,176
AUTOMOTIVE FLOOR MAT HAVING RIGID RIB

Ted A. Bell; Timothy S. Cooksey, both of Cosbocton, and Daniel F. Lehner, West Lafayette, all of Ohio, assignors to Pretty Products, Inc., Cosbocton, Ohio

Continuation-in-part of Ser. No. 135,253, Mar. 31, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 318,841
Int. Cl.³ B32B 3/30, 3/02
U.S. Cl. 428—85 **50 Claims**

1. A floor mat for an automotive vehicle comprising
a flexible, sheet-form main body adapted to be positioned in supported relationship on a vehicle floor and being of an area dimension to cover at least a specified portion thereof, and
a rigidifying rib structure including an elongated, substantially rigid, rib-forming element secured in fixedly assembled association with said main body to effect structural rigidification thereof, said rigidifying rib structure being

formed of a material which is different from the material of said main body and being configured to define a plane that is disposed in substantially parallel relationship to said main body and of an area that is coextensive with at least



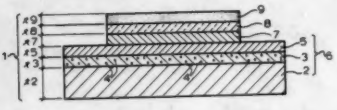
a selected area portion of said main body to provide structural rigidity in substantially mutually perpendicular directions with respect to said main body whereby at least the selected area portion of said main body is effectively rendered substantially inflexible.

4,399,177

SUPPORTING STRUCTURE FOR DECALCOMANIA

Tetsuya Ozasa, Kawasaki, Japan, assignor to Tokyo Tokushu Insatsu Kogyo Kabushiki Kaisha, Japan

Filed Aug. 28, 1981, Ser. No. 297,163
Int. Cl.³ B32B *23/06*; C09J *7/02*
U.S. Cl. 428—199 6 Claims



1. A supporting structure for a decalcomania adapted for use with a color developing solution of predetermined temperature comprising a supporting sheet having a coating of a water soluble separating agent thereon in which there is dispersed an inorganic color forming compound which reacts with said color developing solution to generate a color, the concentration of inorganic compound being such that said color is generated at approximately the time that said water soluble separating agent is dissolved in said color forming solution.

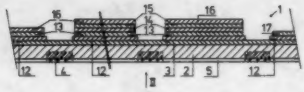
4,399,178

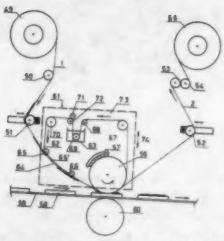
DECALCAMANIA PICTURE FOR APPLYING DESIGNS OR IMPRINTS TO OBJECTS OF GLASS, CERAMICS OR SUCH-LIKE, PROCESS FOR TRANSFERRING DECALCAMANIA PICTURE OF THAT KIND, AND APPARATUS FOR CARRYING OUT SAID PROCESS

Franz Barta, Vienna, Austria, assignor to Franz Barta Kommanditgesellschaft, Vienna, Austria

Division of Ser. No. 111,408, Jan. 11, 1980, Pat. No. 4,379,017.
This application Apr. 27, 1982, Ser. No. 372,402
Claims priority, application Austria, Jan. 12, 1979, 248/79
Int. Cl.³ B32B *3/02*, *7/06*; B05D *1/32*
U.S. Cl. 428—202 15 Claims

1. A decalcamania picture for transferring under the influence of moisture a design or image to glass- or ceramics-type material, which comprises a water-absorbing carrier paper having on one surface a vitrifiable color image layer not extending over the entirety of the paper and an interface layer between said image layer and said paper to ease separation thereof, and on its other surface a substantially water impervi-





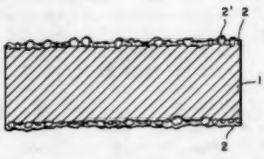
ous screening layer which is intact only in those areas corresponding to those where no color image is present on the opposite side of the paper.

4,399,179

POLYESTER LAMINATED FILM

Satoyuki Minami, Ohtsu; Ryuichi Nagata, Karahashi, and Toshihiro Otaki, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,713
Claims priority, application Japan, Jan. 12, 1980, 55-167973
Int. Cl.³ B32B *7/02*, *5/16*
U.S. Cl. 428—212 28 Claims

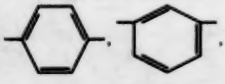


1. A polyester laminated film which comprises a transparent layer and a delustered layer laminated at least on one side face of said transparent layer, said transparent layer comprising a biaxially stretched polyester film mainly composed of polyethylene terephthalate, said delustered layer comprising an at least uniaxially stretched polyester film which is mainly composed of a polyethylene terephthalate copolymer containing, as a copolymer composition,

$$H\leftarrow OCH_2CH_2\rightarrow_{\overline{n}}OH \text{ or}$$

$$H\leftarrow OCH_2CH_2\rightarrow_{\overline{n-1}}O-X-O\leftarrow CH_2CH_2O\rightarrow_{\overline{n-1}}H$$

(wherein n is an integer from 2 to 140, and X represents



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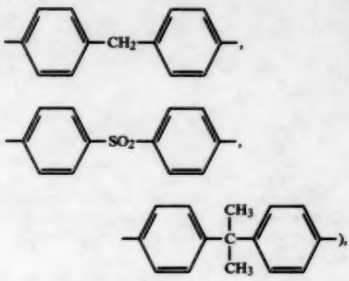


by 1 to 20 mol. %, and which also contains inert inorganic particles of 0.3 to 20 microns at 3 to 40% by weight.

4,399,180

COEXTRUDED THERMOPLASTIC STRETCH-WRAP

William F. Briggs, Chelmsford, Mass., and Edward M. Bullard, Rochester, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 187,678, Sep. 16, 1980, abandoned, which is a continuation-in-part of Ser. No. 942,715, Sep. 15, 1978, abandoned. This application Apr. 29, 1982, Ser. No. 373,079

Int. Cl.³ B32B *7/02, 27/08*

U.S. Cl. 428—212 **4 Claims**

1. A thermoplastic film adapted for use as a stretch film wrap comprising a coextruded three-layer thermoplastic film having a core layer comprising a linear low-density polyethylene, said linear low-density polyethylene consisting essentially of ethylene co-polymerized with a minor amount of at least one alpha-olefin having four to ten carbon atoms and exterior skin layers comprising highly-branched low-density polyethylene.

4,399,181

COLD DRAWN HIGH-ORIENTATION MULTILAYERED FILM AND PROCESS FOR MANUFACTURE OF SAID FILM

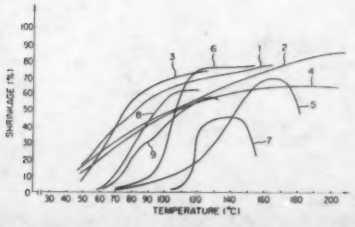
Isao Yoshimura, Fugisawa; Osamu Mizukami, Kawasaki; Hideo Hata; Junichi Kageyama, both of Yokohama, and Takashi Kaneko, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 103,944, Dec. 14, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,062

Claims priority, application Japan, Dec. 18, 1978, 53-154966; Mar. 7, 1979, 54-25642

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—213 **33 Claims**



1. A cold drawn high-orientation multilayered film, having a tensile strength of not less than 5.0 g/mm², the principal component layers of said film being highly oriented, said multilayer film comprising at least one layer preponderantly comprising a cold-drawable resin selected from the group consisting of blended and unblended specific polymers, [1] (B)+(A)+(C), [2] (B)+(A), [3] (B)+(C), [4] (D), and [5] (E),

wherein,

(A) is at least one ethylene type polymer selected from the group consisting of copolymers of ethylene with another monomer selected from the group consisting of vinyl esters, aliphatic unsaturated carboxylic acids and alkyl esters of said carboxylic acids, ionically crosslinked resins derived from said copolymers and low-density polymers of ethylene,

(B) is a soft copolymer elastomer having a Vicat softening point of not more than 60° C.

(C) is at least one polymer selected from the group consisting of crystalline polypropylene, high-density polyethylene, crystalline polybutene-1, and polymethyl pentene-1,

(D) is a crystalline polybutene-1 having a concentration of 50 to 100% by weight, and

(E) is an ionically crosslinked resin, said multilayered film consisting of

at least one cold drawable resin layer (CDR_{1-3}) preponderantly containing at least one cold drawable resin selected from the group consisting of blended polymers [1], [2], and [3], and at least one cold drawable resin layer (CDR_4) preponderantly containing a polymer [4],

and said film having a multilayer construction represented by the layer combination of

(I) CDR_{1-3}/CDR_4 or $CDR_{1-3}/CDR_4/CDR_{1-3}$.

4,399,182

DECORATIVE LAMINATE OF THERMOPLASTIC MATERIAL

Kenneth D. Brown, Tynemouth, and Terence C. O'Neill, Cramlington, both of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

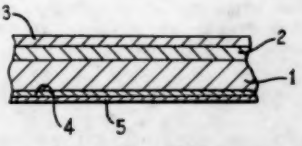
PCT No. PCT/GB81/00109, § 371 Date Feb. 5, 1982, § 102(e) Date Feb. 5, 1982, PCT Pub. No. WO82/00021, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 25, 1981, Ser. No. 348,049

Claims priority, application United Kingdom, Jun. 25, 1980, 8020829

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—215 **2 Claims**



1. A decorative laminate comprising a protective layer, a continuous decorative layer of polyvinyl chloride and a base layer of rigid polyvinyl chloride containing not more than 2% plasticizer and having a thickness between 2 and 4 times the thickness of the decorative layer, the laminate having a total thickness in the range of 250 to 450 microns, a shrinkage of less than 0.5% at ambient temperatures, and a rigidity in the lengthwise and crosswise directions in the range of 25,000 to 30,000 Kilo Newtons per meter square.

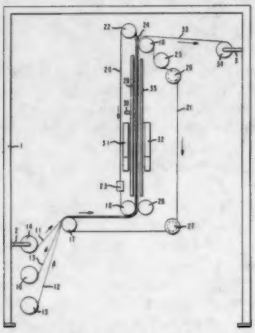
4,399,183
WEB-SUPPORTED MEMBRANE

Michael S. Withers, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 121,461, Feb. 14, 1980, Pat. No. 4,324,606, which is a continuation-in-part of Ser. No. 107,521, Dec. 27, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 304,105

Int. Cl.³ B32B 7/00

U.S. Cl. 428—247 26 Claims



1. A reinforced membrane which consists essentially of at least two layers of melt fabricable fluorinated polymer which contains side chains containing sulfonyl and/or carboxyl groups in melt fabricable form, and a woven reinforcing fabric comprising warp and fill strands, there being at least one layer of a said fluorinated polymer on each side of said reinforcing fabric, the warp and fill strands of said reinforcing fabric defining windows between said strands, each layer of fluorinated polymer in at least 70% of the area in each of at least 90% of said windows being of uniform thickness within plus or minus 10%.

4,399,184
RIP RESISTANT NET

George S. Nalle, Jr., 401 Inwood Rd., Austin, Tex. 78746

Filed Feb. 2, 1982, Ser. No. 345,148

Int. Cl.³ B32B 7/00; D03D 9/00

U.S. Cl. 428—255 6 Claims

1. A net-like structure comprising at least two crossing layers, the first of said layers being a first plurality of parallel filaments and the second of said layers being a second plurality of parallel filaments, said first and second pluralities of filaments intersecting one another and being fused together at each point of intersection, each of the filaments in each of said first and second pluralities of filaments being produced by the co-extrusion of two or more polymers wherein a continuous strip of each polymer is in every filament of the net-like structure.

4,399,185
LOW PRESSURE-DROP CATALYTIC MAT AND METHOD OF PREPARING THE SAME

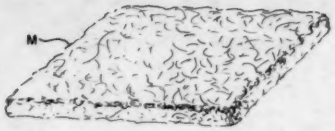
Henry G. Petrow, Watertown, Mass., assignor to Prototech Company, Newton Highlands, Mass.

Filed Sep. 18, 1981, Ser. No. 303,583

Int. Cl.³ B32B 5/16

U.S. Cl. 428—253 21 Claims

1. A low pressure-drop catalytic structure comprising a limp, loosely packed, inorganic fibrous, relatively low surface area porous mat to the fibers of which, throughout the mat, non-volatile relatively high surface area metal oxide particles have been adhered and upon which noble metal catalytic material has been coated.



18. A low pressure-drop catalytic structure as claimed in claim 1 in which the mat comprises fibers selected from a group comprising quartz and quartz-like fibers, ceramic fibers and stainless steel fibers.

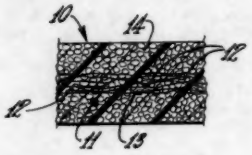
4,399,186
FOAMED ASPHALT WEATHERING SHEET FOR ROLL ROOFING, SIDING, OR SHINGLES

Sanford K. Lauderback, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 29, 1981, Ser. No. 335,434

Int. Cl.³ B32B 5/20, 11/10

U.S. Cl. 428—291 4 Claims



1. In a continuous process of manufacturing weathering sheet of the type used in products such as roll roofing, strip shingles, and siding, said process including coating a preformed flexible fibrous mat on both sides with liquid asphalt, the improvement comprising foaming the liquid asphalt before coating the mat therewith.

4,399,187
REINFORCED ARTICLES

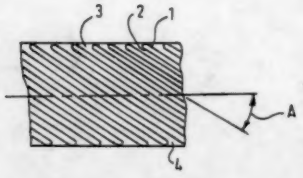
Eric Holroyd, Knutsford, and David J. B. Perkins, Liverpool, both of England, assignors to W & A Bates Limited, London, England

Filed Jul. 13, 1981, Ser. No. 283,039

Claims priority, application United Kingdom, Jul. 26, 1980, 8024545

Int. Cl.³ B60C 9/20

U.S. Cl. 428—295 17 Claims



1. A tire breaker fabric for a pneumatic tire comprising an elongate sheet of tire cord fabric having edges spaced apart by a width of a breaker for which said fabric is intended wherein the tire cords are formed by one single continuous tire cord of twisted filaments of a material having a modulus of

5000–21,000 Kg/mm^2, the filaments of the cord having an angle of twist of not more than 18° where a tangent of the angle of twist is given by the formula

$$\tan(\text{angle of twist}) = \frac{\pi \times \text{cord diameter (mm)}}{2 \times \text{lay length (mm)}}$$

the cord being folded back on itself at folded edges about an axis perpendicular to the plane of the sheet with the filaments of the cord arranged at said folded edges in a vertical line parallel to said axis so that the filaments each have substantially the same bend radius.

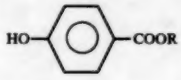
4,399,188

HEAT-SENSITIVE RECORDING SHEET

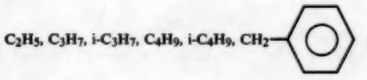
Noboru Yamato, and Tosimi Satake, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

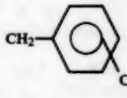
Continuation-in-part of Ser. No. 252,619, Apr. 9, 1981, abandoned. This application Jun. 29, 1981, Ser. No. 278,747
Claims priority, application Japan, Apr. 10, 1980, 55-46195
Int. Cl.^{3} B41M *5/18*
U.S. Cl. 428—320.4 **14 Claims**

1. A heat-sensitive recording sheet having a microcapsule-free color forming layer comprising a colorless or pale-colored chromogenic fluoran type dyestuff and a color-developing agent causes color development only at an elevated temperature, said color-developing agent comprising a p-hydroxybenzoic acid ester having the following general formula



wherein R represents





4,399,189

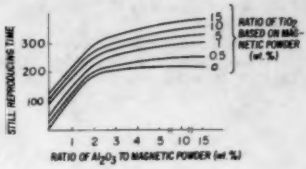
MAGNETIC RECORDING MEDIUM

Yutaka Nakashima, and Akira Okada, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 169,459, Jul. 16, 1980, abandoned. This application Dec. 11, 1981, Ser. No. 329,705
Claims priority, application Japan, Jul. 16, 1979, 54-89256
Int. Cl.^{3} G11B *5/70*; B32B *5/16*
U.S. Cl. 428—328 **4 Claims**

1. The method of improving the still characteristic of a magnetic tape without undesirably increasing the wearing of the head of a recorder, comprising:

applying to a tape substrate a magnetic layer comprising a mixture of a magnetic powder in a synthetic resin binder and a non-magnetic powder component consisting essentially of a first non-magnetic powder of Al_2O_3, Cr_2O_3 or mixtures thereof and a second non-magnetic powder of TiO_2, SiC, SiO_2, ZrO_2, CeO_2 or mixtures thereof, both of said non-magnetic powders being present in said magnetic layer in an amount ranging from 0.5 to 15 weight % with the total of said non-magnetic powders being less than 20 weight % based on the magnetic powder, wherein the



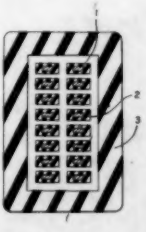
average particle diameter of said first and second non-magnetic powders is in the range of 0.1 to 2μ.

4,399,190

THIN INSULATING MICA SHEET AND INSULATED COIL

Tadashi Iwabuchi, Nagasaki, and Osamu Hayashi, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,765
Claims priority, application Japan, Mar. 11, 1981, 56-36103; Mar. 11, 1981, 56-36105
Int. Cl.^{3} B32B *5/16*
U.S. Cl. 428—336 **8 Claims**

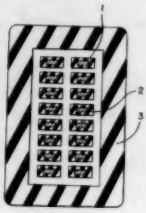


1. A thin insulating sheet which comprises an associated mica sheet containing 1 to 9 wt.% of a polymer fibril which is melt-bonded to a polymer film without using a binder, the melt-bonded composite having a thickness of 35–65 μm, and impregnated with a resin in a prepreg form, wherein said polymer film is selected from the group consisting of a polyimide film, a polyparabanic acid film, a polyamide film and a polyester film.

4,399,191
THIN INSULATING MICA SHEET AND INSULATED COIL

Tadashi Iwabuchi, Nagasaki, and Osamu Hayashi, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,766
Claims priority, application Japan, Mar. 11, 1981, 56-36102; Mar. 11, 1981, 56-36104
Int. Cl.³ B32B 5/16
U.S. Cl. 428—336 6 Claims



1. A thin insulating sheet having a thickness of 35–65 μm which comprises an associated mica sheet containing 1 to 9 wt.% of a polymer fibril which is melt-bonded to a polymer film without using a binder.

4,399,192
RADIATION CURED ABRASION RESISTANT COATINGS OF PENTAERYTHRITOL ACRYLATES AND CELLULOSE ESTERS ON POLYMERIC SUBSTRATES

Raymond J. Russell, Lincoln Park, N.J., assignor to Panelographic Corporation, West Caldwell, N.J.

Division of Ser. No. 104,351, Jan. 7, 1980, Pat. No. 4,308,119, which is a continuation-in-part of Ser. No. 13,418, Feb. 21, 1979, abandoned. This application Oct. 23, 1981, Ser. No. 314,128
Int. Cl.³ B32B 27/36, 27/10, 23/08, 27/06
U.S. Cl. 428—412 3 Claims

1. A product comprising a substrate selected from the group consisting of polyacrylics, polyvinyls, polycarbonates and polyesters having coated thereon a cured, abrasion resistant, optical coating composition consisting essentially of a pentaerythritol-based polyacrylate selected from the group consisting of a pentaerythritol polyacrylate, a pentaerythritol polymethacrylate, a dipentaerythritol polyacrylate, a dipentaerythritol polymethacrylate, a tripentaerythritol polyacrylate and a tripentaerythritol polymethacrylate, a cellulose ester comprising the reaction product of cellulose with at least one organic carboxylic acid having from 2 to 4 carbon atoms or nitric acid and a photoinitiator, wherein the weight ratio of said polyacrylate to said ester is from about 6 to 1 to about 100 to 1.

4,399,193
HYDROPHILIC COATINGS AND PROCESS FOR PREPARING THE SAME

Gerhard Preiner; Johann Müller, and Karl-Heinrich Wegehaupt, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,950
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039721
Int. Cl.³ B05D 3/02; B32B 9/04
U.S. Cl. 428—447 9 Claims

1. A process for coating a substrate which comprises applying to the substrate an aqueous solution containing an organopolysiloxane having Si-bonded hydrogen atoms and SiC-bonded hydrocarbon groups with aliphatic multiple bonds, in which the total number of Si-bonded hydrogen atoms and Si-bonded hydrocarbon groups having aliphatic multiple bonds is at least 3 per molecule, with the proviso that no more than one hydrocarbon group having aliphatic multiple bonds is bonded to any one silicon atom and having at least one SiC-bonded radical of the formula $—R^3—(OCHR^4CH_2)_mOY$ per molecule, where R^3 represents a bivalent hydrocarbon radical free of aliphatic multiple bonds having from 1 to 4 carbon atoms, R^4 is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical which is free of aliphatic multiple bonds and has from 1 to 4 carbon atoms, Y is selected from the group consisting of hydrogen, an acyl radical having from 1 to 3 carbon atoms per radical which is free of aliphatic multiple bonds and R^4 and m is an integer of from 2 to 30 and a platinum catalyst capable of promoting the addition of Si-bonded hydrogen to SiC-bonded hydrocarbon groups having aliphatic multiple bonds and thereafter heating the coated substrate to a temperature of from 70° to 165° C. to crosslink the organopolysiloxane.

5. The coated substrate obtained from the process of claim 1.

4,399,194
TRANSPARENT CONDUCTIVE FILM

Joseph Zelez, Tannersville, Pa., and John L. Vossen, Jr., Bridgewater, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,708
Int. Cl.³ B32B 15/04
U.S. Cl. 428—457 2 Claims

1. An article comprising a transparent conductive film comprised of indium oxide and zirconium oxide on a suitable substrate.

4,399,195
PRESERVATION OF WOOD

William R. Allen, Sr., Port Murray, N.J., assignor to Cherokee Industries, Inc., Hayward, Wis.

Filed Aug. 24, 1981, Ser. No. 295,850
Int. Cl.³ B27K 3/40; B32B 21/08; C08K 5/13
U.S. Cl. 428—541 31 Claims

1. An aqueous water-dilutable concentrate suitable for treating wood by deep penetration, said concentrate consisting essentially of:

(a) an effective wood preserving amount of a halogenated phenol wood preservative;

(b) an effective amount of a phenolic resin prepolymer which after curing is sufficient to prevent the migration of the halogenated phenol from the wood; and

(c) a polar cosolvent coupling agent present in an effective amount sufficient for enhancing the water solubility of said concentrate.

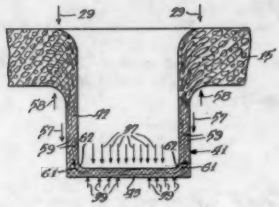
4,399,196
INTEGRAL FLANGES IN A SHEET

John A. Schey, Waterloo, Canada, assignor to Modine Manufacturing Company, Racine, Wis.

Division of Ser. No. 134,513, Mar. 27, 1980, Pat. No. 4,373,369. This application Aug. 18, 1982, Ser. No. 409,704
Int. Cl.³ B21D 22/00; B21C 37/00; F28F 9/02
U.S. Cl. 428—582 3 Claims

1. A metal plate having an integral depression in which said

depression has parallel walls of uniform thickness from plate surface to base and a base thinner than said plate thickness, and



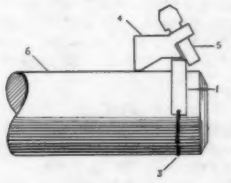
a continuous grain flow when viewed in a section made in a plane along the original rolling direction of said plate.

4,399,197

CUTTING PIPE WITH A CUTTING TORCH

Arthur E. Vandell, 66 Stuyvesant Ave., Staten Island, N.Y. 10312

Filed Jul. 9, 1981, Ser. No. 281,682
Int. Cl.³ B23K *7/04*
U.S. Cl. 428—584 1 Claim



1. An apparatus for uniformly cutting pipes comprised of:

a thin strip of flexible, spring-like metal with straight edges, having equally spaced metal support legs attached at right angles to one side of said strip,

said strip having a chain and a tension spring attached to one end thereof with means to attach said chain and said tension spring to the other end of said strip,

said strip with said chain and said tension spring being capable of being secured about the circumference of a pipe to provide a guide that stands at a consistent height above the surface of a pipe, said guide having the capability of guiding a torch for uniformly cutting pipes.

4,399,198

LINING ALLOY FOR BIMETALLIC CYLINDERS

Donald P. Lomax, 649 Stourbridge Pl., P.O. Box 232, and Ronald M. Boggs, P.O. Box 253, both of Wales, Wis. 53183

Filed Jul. 20, 1981, Ser. No. 284,631
Int. Cl.³ B32B *15/18;* C22C *30/00*
U.S. Cl. 428—595 6 Claims

1. A hard, wear and corrosion resistant alloy consisting essentially of the following materials fused together in the weight percentage composition stated below:

Ingredient	Weight Percent
Carbon	0.16 to 0.35
Nickel	28.50 to 34.60
Manganese	0.34 to 0.75
Silicon	0.75 to 1.90
Chromium	4.50 to 7.50
Boron	2.25 to 2.90
Cobalt	28.50 to 42.00

-continued

Ingredient	Weight Percent
Vanadium Carbide	8.00 to 15.00
Tungsten Carbide	2.00 to 7.00
Titanium Carbide	1.00 to 3.00
Tantalum Carbide	1.00 to 2.00

3. In combination, a steel cylinder and a lining for said cylinder consisting of a hard, wear and corrosion resistant alloy consisting essentially of the following materials in the weight percentage composition stated below:

Ingredient	Weight Percent
Carbon	0.16 to 0.35
Nickel	28.50 to 34.60
Manganese	0.34 to 0.75
Silicon	0.75 to 1.90
Chromium	4.50 to 7.50
Boron	2.25 to 2.90
Cobalt	28.50 to 42.00
Vanadium Carbide	8.00 to 15.00
Tungsten Carbide	2.00 to 7.00
Titanium Carbide	1.00 to 3.00
Tantalum Carbide	1.00 to 2.00

4,399,199

PROTECTIVE LAYER

Ian R. McGill, Thatcham, and Gordon L. Selman, Sonning Common, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 115,553, Jan. 25, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,788
Claims priority, application United Kingdom, Feb. 1, 1979, 7903511
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—633 6 Claims

1. An article which is protected to retain strength and corrosion resistance when used in contact with hot gases at temperatures of up to 1600° C., said protected article including a metallic substrate on which there is directly deposited a first protective coating or layer having a thickness within the range of 2 to 25 microns thickness and consisting essentially of (1) one or more of the platinum group metals or (2) one or more of the platinum group metals and at least one refractory oxide forming element, protecting the surface of the metallic substrate and on which first coating or layer there is directly deposited a second coating or layer comprising a thermal barrier layer having a thickness between 250 and 500 microns, the thermal barrier layer being bonded to the metal substrate by means of said first coating or layer, the substrate being selected from the group consisting of nickel-, cobalt- and iron-based superalloys and the thermal barrier layer comprising stabilised zirconia, the first coating or layer being characterized by its thermal expansion compatibility with the stabilised zirconia and its low rate of oxygen permeation.

4,399,200

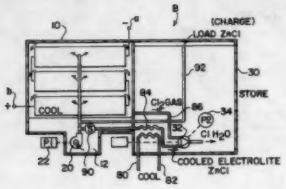
DEVICE FOR CONTROLLING A PUMP IN A STORAGE BATTERY

James H. Galloway, New Baltimore, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Nov. 5, 1981, Ser. No. 318,468
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—23 28 Claims

1. In a system for controlling flow rates in a storage battery of the type having at least one pump driven at a controlled speed by a motor driven at a speed determined by the average applied voltage and the load experienced by the pump, said system including a circuit for applying an average voltage to

said motor and means for generating a reference signal for controlling the general magnitude of said average applied voltage to drive said pump at a desired speed, the improvement comprising: means for supplying a main voltage level of a given magnitude; means for alternately switching said main voltage level across said motor; said switching means having a first condition with said voltage level applied across said motor



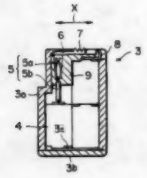
and a second condition with said voltage level generally isolated from said motor; and, signal generator means normally responsive to a voltage control signal controlled at least in part by said reference signal for creating a signal to change the relative time said switching means is in said first condition compared to the time said switching means is in said second condition.

4,399,201

BATTERY CASING

Kazuyuki Nagahara, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,504
Int. Cl.³ H01M *6/00, 8/00, 2/02, 2/00*
U.S. Cl. 429—48 **11 Claims**



1. A battery cartridge for use with a battery-powered electrical device, comprising:

(a) a casing for containing therein a plurality of dry cell batteries, said casing being detachable from said electrical device;

(b) first and second output terminals for supplying said electrical device with electrical power therethrough from said dry cell batteries, at least one of said first and second output terminals being positioned within said casing, said first and/or second output terminals, which is/are positioned within said casing, being arranged to be in contact with a conductive projection of said electrical device when said projection is inserted into said casing via an opening provided in the vicinity of said first and/or second output terminal, which is/are positioned within said casing;

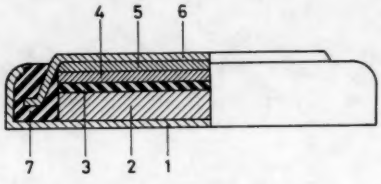
(c) a movable piece arranged to assume first and second positions, said movable piece covering said opening when in said first position and uncovering said opening when in said second position for allowing said projection to be inserted into said casing via said opening.

4,399,202

LITHIUM BATTERY

Hironosuke Ikeda, Hirakata; Satoshi Narukawa, and Shigehiro Nakaido, both of Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 129,717, Mar. 12, 1980, abandoned.
This application Jun. 8, 1981, Ser. No. 271,236
Claims priority, application Japan, Mar. 19, 1979, 54-30095
Int. Cl.³ H01M *10/48*
U.S. Cl. 429—91 **5 Claims**



1. A battery comprising:

a positive electrode consisting essentially of manganese dioxide as an active material;

a negative electrode consisting essentially of lithium as an active material, said negative electrode having a much larger electrode potential and a smaller discharge capacity than said positive electrode; and

an electrolyte comprising of an organic material which is a solution of a salt of lithium in an organic solvent.

4,399,203

SULFIDE AND SELENIDE COMPOSITIONS

Phillip D. Bennett, Cleveland Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 15, 1982, Ser. No. 368,789
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **10 Claims**

1. A composition of the formula:

$$[AlYZ_2]_n[A_aCs_b]_n \quad (I)$$

wherein:

Y is selected from the group consisting of S and Se;

Z is selected from the group consisting of Cl, Br and I or combinations thereof;

A is selected from the group consisting of Li, Na or K or combinations thereof;

n is a positive integer;

a is a number greater than 0.1,

b is a number greater than 0.01 and the sum of a+b equals 1.

6. An electrical energy storage device comprising:

(a) a housing;

(b) at least two electrodes, including a positive electrode and a negative electrode, positioned within said housing; and,

(c) an ionic conducting solid electrolyte disposed between and electrically contacting said electrodes; and wherein said ionic conducting solid electrolytes comprises a composition of the formula:

$$[AlYZ_2]_n[A_aCs_b] \quad (I)$$

wherein

Y is selected from the group consisting of S and Se;

Z is selected from the group consisting of Cl, Br and I or combinations thereof;

A is selected from the group consisting of Li, Na or K or combinations thereof;

n is a positive integer;

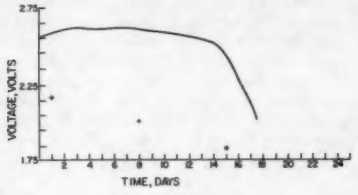
a is a number greater than 0.1,

b is a number greater than 0.01 and the sum of a+b equals 1.

4,399,204
SOLID CATHODE COMPRISING A LEAD FLUORIDE/TIN FLUORIDE COMPOUND

Milton B. Clark, Brecksville, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1981, Ser. No. 278,966
Int. Cl.³ H01M *6/14, 4/58, 4/56*
U.S. Cl. 429—197 **6 Claims**

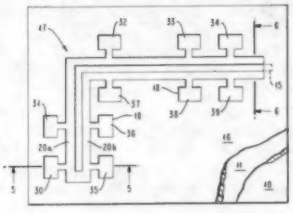


1. A nonaqueous cell comprising an active metal anode, an organic electrolyte solution, and a solid cathode material comprising a compound of lead fluoride and tin fluoride having a mole ratio between 4:1 to 1:4.

4,399,205
METHOD AND APPARATUS FOR DETERMINING PHOTOMASK ALIGNMENT

Albert S. Bergendahl, Underhill, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,942
Int. Cl.³ G03C *5/06*
U.S. Cl. 430—30 **7 Claims**



1. The method of electrically characterizing the performance of a photolithographic exposure tool comprising the steps of:

providing a substrate standard, against which said tool may be characterized, having a substantially non-conductive surface in which a first relief image pattern is defined by first and second levels on the surface of said substrate,

applying a layer of selectively etchable material over the surface of the substrate,

forming a second relief image pattern in said layer of selectively etchable material to expose at least portions of said first and second levels, said second relief pattern being substantially defined by imagewise expose in the exposure tool to be characterized,

said first relief image pattern defining and establishing at least one edge of said second pattern to thereby determine the alignment of that second relief pattern with respect to said standard,

depositing a layer of conductive material over said second relief image pattern and exposed areas of said substrate, said first relief image pattern bifurcating said deposited layer of conductive material,

removing the remaining portions of said selectively etchable material and overlying portions of said conductive layer, and

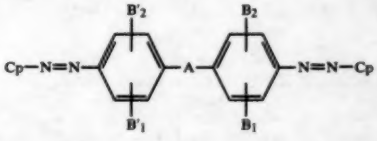
measuring an electrical characteristic of at least two different portions of said bifurcated conductive layer remaining on one of said first and second levels, the measured characteristic being representative of the extent to which said photolithographic tool-exposed second relief image is aligned with and bifurcated by said first relief image in said substrate.

4,399,206
DISAZO ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

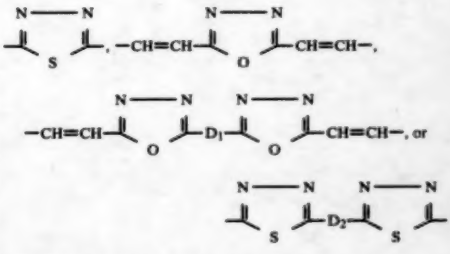
Kazuharu Katagiri, Mitaka; Katsunori Watanabe, Yamato; Shozo Ishikawa, Sayama, and Makoto Kitahara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1981, Ser. No. 307,154
Claims priority, application Japan, Oct. 6, 1980, 55-138717; Oct. 9, 1980, 55-140412; Oct. 14, 1980, 55-142505; Oct. 28, 1980, 55-150225; Oct. 28, 1980, 55-150226; Nov. 4, 1980, 55-153815
Int. Cl.³ G03G *5/06, 5/14*
U.S. Cl. 430—58 **41 Claims**

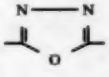
1. An electrophotographic photosensitive member characterized by having a conductive support, a charge transport layer and a charge generation layer which contains at least one disazo pigment of the formula:



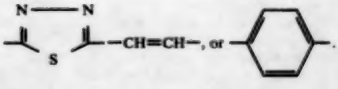
wherein Cp is a coupler residue; B_1, B_2, B'_1, and B'_2 are each selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, acylamino, and hydroxyl; and A is



wherein D_1 and D_2 each is a single bond between two



or between two



4,399,207
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH HYDRAZONE COMPOUND

Kiyoshi Sakai, Mitaka; Minoru Mabuchi, Tokyo; Shozo Ishikawa, Sayama, and Makoto Kitahara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

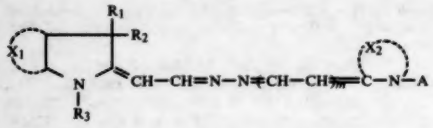
Filed Jul. 22, 1982, Ser. No. 400,685

Claims priority, application Japan, Jul. 31, 1981, 56-120454; Aug. 6, 1981, 56-123315

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—58 **16 Claims**

1. An electrophotographic photosensitive member having a layer containing at least one compound represented by the following formula (I):



(I)

wherein X_1 is a residue necessary for completing a substituted or unsubstituted aromatic hydrocarbon ring; X_2 is a residue necessary for completing a substituted or unsubstituted heterocyclic ring; R_1, R_2, R_3, and A each is hydrogen or alkyl, aralkyl, or aryl, substituted or unsubstituted; and m is 0 or 1.

9. An electrophotographic photosensitive member of claim 1, which has a charge generation layer and a layer containing at least one compound represented by formula (I).

4,399,208
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Yoshio Takasu, Tama; Norie Takebayashi, Tokyo; Kiyoshi Sakai, Mitaka; Minoru Mabuchi, Tokyo, and Shozo Ishikawa, Sayama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

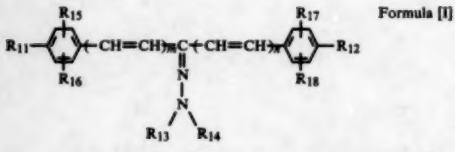
Filed Nov. 9, 1981, Ser. No. 319,269

Claims priority, application Japan, Nov. 22, 1980, 55-165065; Nov. 22, 1980, 55-165067; May 7, 1981, 56-68695; May 9, 1981, 56-69765

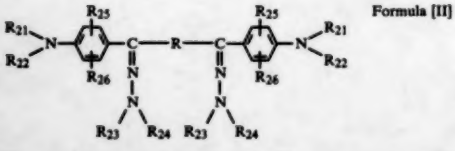
Int. Cl.³ G03G *5/04*

U.S. Cl. 430—59 **51 Claims**

1. An electrophotographic photosensitive member characterized by having a conductive support and a layer containing at least one hydrazone compound represented by the following formula [I] or [II]:



Formula [I]



Formula [II]

wherein R_{11} and R_{12} represent hydrogen, halogen, substituted or unsubstituted alkyl, alkoxy, substituted or unsubstituted aryloxy, or substituted amino, provided that at least one of R_{11} and R_{12} is substituted amino or alkoxy; R_{13} and R_{14} represent substituted or unsubstituted alkyl or substituted or unsubstituted aryl, provided that at least one of R_{13} and R_{14} is substituted or unsubstituted aryl, or R_{13} and R_{14}, together with the nitrogen atom which links them, represent a nitrogen-containing heterocyclic ring; R_{15}, R_{16}, R_{17}, and R_{18} represent hydrogen, halogen, substituted or unsubstituted alkyl, alkoxy, substituted or unsubstituted aryloxy, or substituted amino; m and n represent 0 or 1; R_{21} and R_{22}, represent substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, or R_{21} and R_{22}, together with the nitrogen atom which links them, represent a five- or six-membered ring; R_{23} and R_{24} represent substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or R_{23} and R_{24}, together with the nitrogen atom which links them, represent a five- or six-membered ring; R_{25} and R_{26} represent hydrogen, halogen, nitro, substituted or unsubstituted alkyl, alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted acyl, or substituted or unsubstituted amino; and R represents divalent organic residue.

4,399,209
TRANSFER IMAGING SYSTEM

Frederick W. Sanders; Gary F. Hillenbrand; Jonathan S. Arney, and Richard F. Wright, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 12, 1981, Ser. No. 320,356

Int. Cl.³ G03C *1/40, 1/00*

U.S. Cl. 430—138 **31 Claims**

1. A transfer imaging system in which images are formed by image-wise reaction of one or more chromogenic materials and a developer, said system comprising:

an imaging sheet comprising a first substrate,

a chromogenic material,

a radiation curable composition which undergoes an increase in viscosity upon exposure to actinic radiation,

a coating on one surface of said first substrate comprising said chromogenic material and said radiation curable composition,

said radiation curable composition being encapsulated in rupturable capsules as an internal phase, and

a developer sheet comprising a second substrate and a developer material capable of reacting with said chromogenic material to form an image on one surface of said second substrate,

wherein images are formed by image-wise exposing said coating to actinic radiation, and rupturing capsules in the image areas with said coating in facial contact with said developer sheet such that said internal phase is image-wise released from said ruptured capsules and there is image-wise transfer of said chromogenic material to said developer sheet and a patterned image-forming reaction occurs between said chromogenic material and said developer material.

4,399,210
PHOTOSENSITIVE COMPOSITIONS

Teruo Nagano, Minami-ashigara, and Akira Nagashima, Shizuoka, both of Japan, assignors to Fuji Photo Film Company Ltd., Kanagawa, Japan

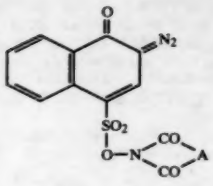
Filed Apr. 1, 1982, Ser. No. 364,274

Claims priority, application Japan, Apr. 1, 1981, 56-49716

Int. Cl.³ G03C *1/54, 1/60, 1/71*

U.S. Cl. 430—175 **23 Claims**

1. A photosensitive composition containing at least one o-naphthoquinonediazide compound represented by the following general formula (I)



(I)

wherein A represents a divalent aliphatic residue, a divalent substituted aliphatic residue, a divalent aromatic residue or a divalent substituted aromatic residue, and a discoloring agent which changes its color tone upon the interaction with a photodecomposition product of the o-naphthoquinonediazide compound.

14. The photosensitive composition as claimed in claim **1**, wherein the composition additionally containing a photosensitive resist forming material.

15. The photosensitive composition as claimed in claim **14**, wherein the photosensitive resist forming material is a diazo resin or an o-quinonediazide compound.

4,399,211

PHOTOPOLYMERIZABLE COMPOSITIONS

Syunichi Kondo; Akihiro Matsufuji; Akira Umehara; Toshinao Ukai, all of Asaka, and Akira Sato, Minami ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

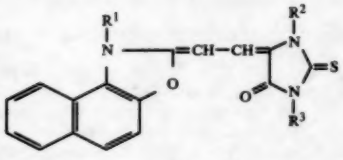
Continuation of Ser. No. 2,778, Jan. 11, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,756

Claims priority, application Japan, Jan. 11, 1978, 53-1755

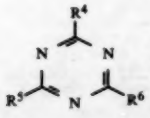
Int. Cl.³ G03C *1/68*

U.S. Cl. 430—269 **16 Claims**

1. In a photopolymerizable composition comprising, as essential components, (A) a compound having at least one ethylenically unsaturated double bond capable of undergoing addition polymerization and (B) a photopolymerization initiator, the improvement wherein said component (A) is an oligoester acrylate or oligoester methacrylate obtained by esterification of acrylic or methacrylic acid, a polybasic acid and a polyol and said photopolymerization initiator consists essentially of a combination of (a) a 5-(substituted naphthol(1,2-D)oxazol-2-ylidene)ethylidene-2-thiohydantoin compound represented by formula (II) and (b) a 2,4,6-substituted-1,3,5-triazine compound represented by formula (III):



(II)



(III)

wherein R^1, R^2 and R^3 each represents an alkyl group, a substituted alkyl group, an alkenyl group, an aryl group, a substituted aryl group or an aralkyl group, which may be the same or different; and R^4, R^5 and R^6 each represents an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or an aralkyl group, which may be the same or different but at least one of which represents a mono-, di- or trihalogenomethyl group.

4,399,212

METHOD OF PROCESSING AN EXPOSED PHOTOGRAPHIC MATERIAL AND PROCESSING BAND FOR CARRYING OUT THE METHOD

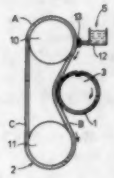
Immo Boie, Langenfeld; Hermann Lührig, Leverkusen; Guido Kovacic, Unkel, and Karlheinz Keller, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,197

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108534

Int. Cl.³ G03C *5/30;* **B65D** *85/66;* **G03D** *5/00*

U.S. Cl. 430—404 **21 Claims**



1. A method of processing a photographic material in the form of a sheet which has been image exposed, in which the photographic material is brought into surface contact with the support impregnated with the required processing chemicals in the presence of the required quantity of water, characterised in that

the photographic material which has been image exposed is moved repeatedly along a closed path having radii of curvature perpendicular to the active surface of the photographic material,

the photographic material is brought into surface contact with a processing band over a specified portion of the closed path in the presence of the required quantity of water, and

arranged one behind the other in the longitudinal direction, the processing band has at least two sections with different processing functions or processing chemicals, so that in the course of processing, every portion of the photographic material is successively brought into contact with at least two sections having different processing functions.

4,399,213

SILVER HALIDE PHOTOSENSITIVE PHOTOGRAPHIC MATERIAL

Yoshikazu Watanabe, Hino, and Motoaki Tanaka, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 145,501, Apr. 29, 1980, abandoned, which is a continuation of Ser. No. 791, Jan. 3, 1979, abandoned. This application Oct. 16, 1981, Ser. No. 312,136

Claims priority, application Japan, Jan. 9, 1978, 53-1442

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—523 **7 Claims**

1. A silver halide photosensitive material comprising a support, and a silver halide photosensitive layer and a protective layer formed on said support in this order, the protective layer being essentially composed of a plurality of non-photosensitive hydrophilic colloidal layers at least one of which contains oil particles, the outermost layer of the hydrophilic colloidal layers containing a matting agent in the form of colloidal particles and having a thickness not more than ½ times an average size of the matting agent particles and wherein the density of the oil particles in the outermost layer is the range not exceeding 0.2 by volume of the binder, and that of the oil

particles in the protective layers other than the outermost layer is in the range of 0.1–0.8.

4,399,214

PROCESS FOR HARDENING COLOR PHOTOGRAPHIC SILVER HALIDE EMULSION LAYERS

Karl Lohmer, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 971,248, Dec. 20, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,359

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759100

Int. Cl.³ G03C *1/74, 1/30, 7/26*

U.S. Cl. 430—532 3 Claims

1. In a process for hardening gelatin for color photographic material which comprises; corona irradiating the surface of a substrate layer support comprised of a cellulose paper which is laminated with a layer of polyolefin on both sides to form an inner paper, said inner paper having an equilibrium moisture of 30–60% relative humidity, casting at least one gelatin-containing color component silver halide emulsion layer associated with a supported gelatin layer on said support, the improvement of adding to a casting solution for at least one layer for application, a solution consisting essentially of gelatin, a hardening solution of 0.4 to 0.8% by weight, based on gelatin, of 1,3,5-triacrylohexahydro-1,3,5-triazine and a polyhydric aliphatic alcohol with from 3 to 10 carbon atoms in an amount of 2 to 20 times the quantity of the hardener by weight on said support.

4,399,215

DOUBLE-JET PRECIPITATION PROCESSES AND PRODUCTS THEREOF

Jong-Shinn Wey, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,908, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,403

Int. Cl.³ G03C *1/02, 5/26*

U.S. Cl. 430—567 17 Claims

1. A radiation-sensitive photographic emulsion comprising a dispersing medium and silver chloride grains, wherein at least 50 percent of the total projected area of said silver chloride grains is provided by tabular grains which are substantially internally free of both bromide and iodide, have an average aspect ratio greater than 8:1, and have opposed, substantially parallel major {111} crystal faces.

4,399,216

PROCESSES FOR INSERTING DNA INTO EUCARYOTIC CELLS AND FOR PRODUCING PROTEINACEOUS MATERIALS

Richard Axel, New York; Michael H. Wigler, Cold Spring Harbor, and Saul J. Silverstein, Irvington, all of N.Y., assignors to The Trustees of Columbia University, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,513

Int. Cl.³ C12N *15/00, 5/00;* C12P *21/00;* C12Q *1/68, 1/02, 1/04*

U.S. Cl. 435—6 73 Claims

1. A process for inserting foreign DNA I into a suitable eucaryotic cell which comprises cotransforming said eucaryotic cell with said foreign DNA I and with unlinked foreign DNA II which codes for a selectable phenotype not expressed by said ducaryotic cell, said cotransformation being carried out under suitable conditions permitting survival or identification of eucaryotic cells which have acquired said selectable phenotype, said foreign DNA I being incorporated into the chromosomal DNA of said eucaryotic cell.

4,399,217

PROCESS AND A DEVICE FOR THE DETERMINATION OF SERUM LIPOPROTEINS

Leif T. Holmquist, and Lars A. Carlson, both of Stockholm, Sweden, assignors to Laboratoires Goelia, Paris, France

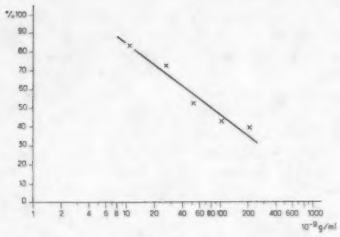
PCT No. PCT/FR80/00067, § 371 Date Dec. 10, 1980, § 102(e) Date Dec. 10, 1980, PCT Pub. No. WO80/02460, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 30, 1980, Ser. No. 224,538

Claims priority, application France, May 2, 1979, 79 11082

Int. Cl.³ G01N *33/92, 33/54*

U.S. Cl. 435—7 17 Claims



1. Process for the determination of serum apoproteins consisting in reacting, on the one hand, a given amount of a specific antibody of the apoprotein whose amount is to be determined, said antibody being fixed on an inert solid support, and, on the other hand, the serum sample to be analyzed and a given amount of an enzyme-lipoprotein coupling compound, corresponding to the apoprotein whose amount is to be determined, after completion of the antibody-lipoprotein reaction separating the support from the non-fixed reagents, and then measuring the enzymatic activity of the complex retained on the support, and wherein said coupling compound is formed by fixation of an enzyme on a fraction of serum lipoprotein containing several distinct apoproteins.

4,399,218

METHOD AND REAGENT FOR THE DETERMINATION OF GLYCERIN

Helmgard Gauhl; Hans Seidel; Gunter Lang, all of Tutzing; Albert Röder, Seeshaupt, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Walhof, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 228,010

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004129

Int. Cl.³ C12Q *1/26, 1/28, 1/30, 1/44;* C12N *1/14, 9/04;* C12R *1/66*

U.S. Cl. 435—25 16 Claims

1. Method for the determination of glycerin by oxidation with oxygen in the presence of glycerinoxidase and measurement of the oxygen consumption or of the formation of H_2O_2, characterized in that a glycerinoxidase from Aspergillus spec. DSM 1729 is used.

4,399,219

PROCESS FOR ISOLATING MICROBIOLOGICALLY ACTIVE MATERIAL

James C. Weaver, Sudbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 29, 1981, Ser. No. 229,484

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.³ C12Q *1/04, 1/18, 1/06;* C12M *1/34*

U.S. Cl. 435—34 25 Claims

1. The process of selecting molecules or cells having a de-

sired microbiological activity of a sample of a given material comprising the steps of:

(a) forming mutually independent samples of said material by

(i) forming a dilute suspension of said material in a liquid diluent capable of forming a gel upon subsequent treatment, said dilute suspension having a dilution selected so that there is provided a high probability that each microsample produced from said suspension contains one or less microbiologically active molecule or cell;

(ii) converting said suspension into gel droplets having a size between about 0.2 and 1000 microns,

(iii) measuring a product of microbiological activity of each of said gel droplets independently of the other of said droplets and

(b) separating gel droplets displaying the desired microbiological activity.

4,399,220

STABILIZING LACTOBACILLI

Martin B. Smiley, Blonay, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Feb. 28, 1979, Ser. No. 16,085

Claims priority, application Switzerland, Mar. 16, 1978, 2861/78

Int. Cl.³ C12N *1/00, 1/20, 15/00;* C12P *7/56*

U.S. Cl. 435—139 2 Claims

1. A process for producing a stable culture of a microorganism of the genus Lactobacillus containing at least one extrachromosomal genetic element which, on the one hand, stimulates its ability to produce lactic acid from lactose and which, on the other hand controls its ability to metabolise N-acetyl-D-glucosamine, which comprises cultivating the microorganism in a nutrient medium of which the principal source of assimilable carbon is N-acetyl-D-glucosamine.

4,399,221

ENZYME PRODUCTION AND PURIFICATION

Michel Schneider, Troinex; Christian Guillot, Carouge, both of Switzerland, and Andre Ayerbe, Roche-sur-Foron, France, assignors to Fisons Limited, London, England

Filed Jun. 26, 1981, Ser. No. 277,706

Claims priority, application United Kingdom, Jul. 5, 1980, 8022105

Int. Cl.³ C12N *9/10;* C12P *19/04, 19/08*

U.S. Cl. 435—193 3 Claims

1. A process for the production of a polysaccharide-producing enzyme comprising:

fermenting bacteria capable of producing dextran, levan or mixtures thereof in an aqueous sucrose solution at a temperature of 23°–25° C.;

maintaining the sucrose concentration in said solution between 1 and 10 g/l during the fermentation by addition of sucrose solution until fermentation is almost complete, then permitting the sucrose concentration to fall below 1 g/l, and

controlling the dissolved oxygen content of the fermentation medium from an initial value of 80–100% of saturation to a final value of 40% of saturation.

4,399,222

CARBOHYDRASES FROM ACIDOPHILIC STREPTOMYCES

Song H. Bok, Decatur, Ill.; LeRoy E. Jackson, Ogden, Utah; Cynthia J. Schroedel, Brookfield, and Martin Seidman, Decatur, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 6, 1979, Ser. No. 64,321

Int. Cl.³ C12N *9/92;* C12P *19/24, 19/14;* C12R *1/465*

U.S. Cl. 435—234 11 Claims

1. A method for producing glucose isomerase which comprises:

(a) inoculating and cultivating a culture medium containing assimilable carbon and nitrogen sources with microorganisms of the genus Streptomyces which will undergo cultivation at a pH less than 5.5, and produce glucose isomerase;

(b) continuing the cultivation for a period of time and under conditions sufficient to permit the microorganisms to produce glucose isomerase; and

(c) harvesting the glucose isomerase produced by said microorganisms from said culture medium.

4,399,223

CELLULAR PRODUCT SEPARATION

John W. Vanderveen; Donald O. Hitzman, and Eugene H. Wegner, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1981, Ser. No. 280,960

Int. Cl.³ C12N *1/02*

U.S. Cl. 435—261 8 Claims

1. A process for separating bacteria cells from a first fermentation liquid in which they are contained comprising:

mixing said first fermentation liquid containing bacteria cells with a second fermentation liquid containing yeast cells to form a mixed product liquid, and

recovering a mixed product of first and second cells by centrifugation of said mixed product liquid.

4,399,224

ENZYMATICALLY TREATED PHOSPHATIDES

Frank J. Flider, Mt. Zion; Frank T. Orthoefer, and Robert G. Short, both of Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jul. 13, 1981, Ser. No. 282,557

Int. Cl.³ C11C *1/00;* A23J *7/00*

U.S. Cl. 435—271 10 Claims

1. A method for converting phosphatide compositions which contain O-glycosyl compounds into a fluid phosphatide composition, said method consisting essentially of enzymatically treating the phosphatide composition with an effective amount of O-glycosyl hydrolase to hydrolyze the O-glycosyl compound within said phosphatide composition and thereby improve upon the fluidity characteristics of said phosphatide composition, and recovering the fluid phosphatide composition therefrom.

4,399,225

STOP-FLOW ANALYSIS

Elo H. Hansen, Lyngby, and Jaromir Ruzicka, Holte, both of Denmark, assignors to Bifok AB, Sollentuna, Sweden

Continuation of Ser. No. 48,002, Jun. 13, 1979, abandoned. This application Aug. 26, 1981, Ser. No. 296,256

Claims priority, application Sweden, Jun. 14, 1978, 7806853

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ G01N *31/14*

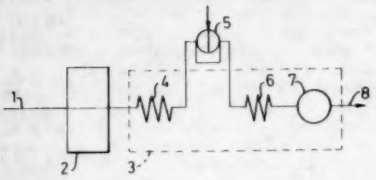
U.S. Cl. 436—34 15 Claims

1. A method for determining the reaction speed of a sample at selected sample concentrations within a sample mixture slug comprising the steps of:

introducing a sample into a flowing carrier stream to form a

sample mixture slug having a forward head portion, a rearward tail portion and a central portion, said sample dispersing within said sample mixture slug to form reproduceable concentration gradients in said head and tail portions in which the concentration of said sample varies;

flowing said carrier stream and sample mixture slug through a measuring cell without removing the head portion or tail portion from said sample mixture slug;



stopping the flow of said carrier stream in response to a selected concentration of sample within one of said concentration gradients as said sample mixture slug passes through said measuring cell; and

measuring the reaction of said sample at said selected concentration for a period of time whereby said reaction speed of said sample at said selected sample concentration may be determined.

4,399,226

TAGGING WITH MICROCAPSULES CONTAINING PERFLUOROALKYL PENTAFLUOROSULFIDE

Richard D. Danielson, Hastings, and Robert A. Prokop, St. Joseph Township, St. Croix County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 946,613, Sep. 28, 1978, Pat. No. 4,306,993. This application Aug. 31, 1981, Ser. No. 298,339

Int. Cl.³ C09K *3/00*

U.S. Cl. 436—56 **4 Claims**

1. The method of detecting an article which comprises associating therewith, as a tag, vapor permeable microcapsules containing volatile perfluoroalkyl pentafluorosulfide, vapors of which diffuse through the walls of the microcapsules and are emitted into the atmosphere surrounding said article, and detecting the presence of said vapors in said atmosphere and thus the presence of said article.

4,399,227

PROCESS FOR DETERMINATION OF GLYCOSYLATED HEMOGLOBIN AND REAGENT THEREFOR

Cornelia Niederau, Wuppertal, and Hans Reinauer, Düsseldorf, both of Fed. Rep. of Germany, assignors to Panchem Gesellschaft für chemische Produkte mbH, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,181

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3119046

Int. Cl.³ G01N *33/66, 33/72*

U.S. Cl. 436—67 **27 Claims**

1. In a process for the determination of the glycosylated hemoglobin content of a blood sample comprising the hemolysis of erythrocytes, the chromatographic separation of hemoglobin fractions and their colorimetric measurement, the improvement wherein the contribution of unstable glucose-aldimine-hemoglobin compounds to the HbA_1 value is substantially eliminated by reacting the hemolysate with a primary amine and a hydrazine compound and thereafter subjecting the hemolysate to chromatography.

4,399,228

POLATE COMPETITIVE PROTEIN BINDING ASSAY

Louis J. Riceberg, Needham, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,477

Int. Cl.³ G01N *33/54, 33/56, 33/58*

U.S. Cl. 436—505 **11 Claims**

1. A process for determining the concentration of N-5-methyltetrahydrofolic acid in a biological sample of unknown N-5-methyltetrahydrofolic acid concentration which comprises separately admixing the biological sample and at least one standard reagent with known quantities of labeled folic acid or labeled folic acid derivative to yield at least two separate test samples, said at least one standard reagent comprising a reconstituted lyophilized complex of N-5-methyltetrahydrofolic acid-folate binding protein, destroying the folate binding protein of said at least one standard reagent and destroying any binding protein present in the biological sample, adding a known quantity of folate binding protein to each test sample, measuring the amount of labeled folic acid or labeled folic acid derivative which does or does not bind to the added binding protein in each test sample and from said measurements determining the concentration of N-5-methyltetrahydrofolic acid in the biological sample.

4,399,229

RAPID RADIOIMMUNOASSAY PRODUCT AND METHOD OF MAKING AND USING SAME

Arden A. Kelton, Westminster; Michael L. Bell, and Roy A. Chung, both of Newport Beach, all of Calif., assignors to Immutron, Inc., Long Beach, Calif.

Filed Apr. 14, 1980, Ser. No. 139,770

Int. Cl.³ G01N *33/54, 33/58, 33/60*

U.S. Cl. 436—519 **4 Claims**

1. In a composite for conducting an immunoassay the combination of: a filter for retaining a bacterium to which an antibody is bound; and said bacterium being entrapped in said filter whereby, when reagents are caused to flow through said filter, said reagents contact said bacterium to facilitate the reaction of said reagents with said antibody.

4,399,230

METHOD OF PLUGGING THE ENDS OF SELECTED DUCTS AND A PASTE FOR USE IN SAID METHOD

Guy Kaltenbach, Versailles, and Pierre Lerner, Chevry, both of France, assignors to Societe Anonyme dite: Compagnie Generale d'Electricite, Paris, France

Filed Jan. 25, 1982, Ser. No. 342,281

Claims priority, application France, Jan. 26, 1981, 81 01374; Jun. 24, 1981, 81 12372

Int. Cl.³ C03C *5/00*

U.S. Cl. 501—20 **18 Claims**

1. A method of plugging the ends of selected ducts in a ceramic honeycomb heat exchange structure, the method comprising the steps of:

preparing a paste comprising a mixture of a solid phase and a liquid phase, the solid phase comprising powder of a glass whose coefficient of expansion is close to that of the ceramic structure and the liquid phase containing a solvent, a plasticizer and an additive which reduces the adherence of the pasge to a paste-applicator tool;

using an applicator tool to push said paste into the ends of selected ducts which are to be plugged; and

heating the ceramic structure to fire the paste to cause it to sealably adhere to the walls of the ducts and become solid such that the closed ducts of said ceramic honeycomb heat exchange structure remain perfectly sealed during use irrespective of thermal expansion and contraction of the heat exchange unit.

4,399,231

DISCONTINUOUS SILICON CARBIDE FIBER REINFORCED GLASS COMPOSITES

Karl M. Prewo, Vernon, and John J. Brennan, Portland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 5, 1982, Ser. No. 345,996

The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.

Int. Cl.³ C04B 35/56; C03C 3/04, 3/08

U.S. Cl. 501—32 8 Claims

1. A silicon carbide fiber reinforced glass composite consisting essentially of about 15% to about 50% by volume high strength and high modulus of elasticity discontinuous silicon carbide fibers laid up in substantially in-plane random orientation in a glass matrix selected from the group consisting of borosilicate glass, high silica content glass, aluminosilicate glass, and mixtures thereof, so as to produce strength and fracture toughness properties greater than that of the glass matrix at temperatures in excess of 300° C. in an oxidizing environment.

4,399,232

CONTINUOUS INORGANIC FIBERS AND PROCESS FOR PRODUCTION THEREOF

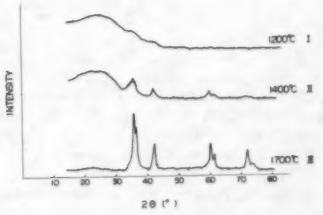
Seishi Yajima; Kiyohito Okamura; Yoshio Hasegawa, and Takemi Yamamura, all of Oharai, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Division of Ser. No. 160,342, Jun. 18, 1980, Pat. No. 4,342,712. This application May 26, 1982, Ser. No. 382,320

Claims priority, application Japan, Jun. 28, 1979, 54-80793; Mar. 11, 1980, 55-29781

Int. Cl.³ C03C 3/12, 14/00; C04B 35/52, 35/80

U.S. Cl. 501—38 7 Claims



1. Continuous inorganic fibers consisting substantially of Si, Ti and C and optionally of O, said fibers being composed of

(1) an amorphous material consisting substantially of Si, Ti and C and optionally of O, or

(2) an aggregate consisting substantially of ultrafine crystalline particles of β-SiC, TiC, a solid solution of β-SiC and TiC and TiC_{1-x} wherein $0<x<1$ and having a particle diameter of not more than 500 Å, in which amorphous SiO_2 and TiO_2 sometimes exist in the neighborhood of these ultrifine crystalline particles, or

(3) a mixture of said amorphous material (1) and said aggregate (2) of ultrafine crystalline particles.

4,399,233

PROCESS FOR PREPARING LOW MOLECULAR WEIGHT OXYGENATED COMPOUNDS FROM SYNGAS USING NOVEL CATALYST SYSTEM

Roger G. Duranleau, Georgetown, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,231

Int. Cl.³ C07C 27/06, 29/15

U.S. Cl. 518—701 24 Claims

1. A process for preparing low molecular weight oxygenated products such as ethylene glycol and methanol from syngas which comprises contacting a mixture of carbon monoxide and hydrogen with a catalyst system comprising a rhodium-containing compound, an organic ligand and a sulfonium salt, and heating the resulting mixture at an elevated temperature and pressure for sufficient time to produce the desired low molecular weight oxygenated products.

4,399,234

PROCESS FOR PREPARING GASOLINE RANGE HYDROCARBONS FROM SYNTHESIS GAS AND CATALYST USED THEREFOR

Harold Beuther, Cheswick; Charles L. Kibby, Gibsonia; Thaddeus P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 13, 1981, Ser. No. 310,972

Int. Cl.³ C07C 1/04

U.S. Cl. 518—715 16 Claims

1. A process for the conversion of synthesis gas consisting essentially of CO and hydrogen to a product high in branched chain paraffins and olefins in the gasoline boiling range, which comprises contacting said synthesis gas under conversion conditions with a catalyst consisting essentially of an admixture of (A) silicalite and (B) cobalt on a high surface area, high purity, low acidity alumina support of gamma-alumina, eta-alumina or mixtures thereof, said catalyst component (B) having a hydrogen chemisorption value of from about 100 to about 300 micromol of hydrogen per gram of total catalyst when measured at 25° C.

4,399,235

HIGH DENSITY ION EXCHANGE RESINS

Charles F. Raley, Jr., and Edward R. Husser, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1981, Ser. No. 262,670

Int. Cl.³ B01J 39/08, 41/08; C08L 23/28

U.S. Cl. 521—31 33 Claims

1. A method for preparing an ion exchange resin, said method comprising the steps of (a) contacting a cross-linked polymer of a monovinylidene aromatic with a halogenating agent in the presence of an organic liquid compound having a dielectric constant sufficiently high to prevent substantial halogenation of the polymeric backbone, said contact being conducted at conditions sufficient to halogenate the polymer and using amounts of the halogenating agent sufficient to increase the density of the polymer and (b) attaching ion-active exchange groups to the halogenated, cross-linked polymer.

4,399,236

PROCESS FOR SEPARATING POLYURETHANE HYDROLYZATES INTO POLYETHER AND DIAMINE

Georg Niederdellmann, Dormagen; Norbert Roemer, Moenchen-Gladbach; Jürgen Schenk, Dormagen; Hartmut Hetzel, Cologne, and Ernst Grigat, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,418

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034680

Int. Cl.³ C08J 11/04; C08G 18/48

U.S. Cl. 521—49 10 Claims

1. A process for separating polyether polyurethane hydrolysates obtained by hydrolysis of polyether polyurethanes into substantially amine-free foamable polyethers and diamines comprising:

(a) expanding or treating in vacuo a hot polyether polyurethane hydrolysate in a manner such that any steam and carbon dioxide initially present may escape;

(b) spraying said hydrolysate and optionally a high-boiling solvent directly into a tubular coil evaporator which

evaporator is heated to 180°–300° C. and has a pressure of from 0.1 to 20 mbar applied at its end;

(c) separating from said hydrolysate a first fraction made up of diamine and a second fraction containing less than 1% by weight of NH_2 in a cyclone;

(d) collecting the first fraction in a receiving vessel and removing any solvent present therein by means of a distillation column to obtain substantially pure diamine;

(e) introducing excess hydrogen chloride into the second fraction to precipitate as a hydrochloride any diamine present in the second fraction;

(f) removing the precipitated hydrochloride from the second fraction by filtration; and

(g) removing any solvent or excess hydrogen chloride present in the filtrate of step (f) by subjecting the filtrate to reduced pressure and thereby recovering an amine-free polyether.

4,399,237

VESICULATED POLYMER GRANULES CONTAINING TiO_2

William H. Morrison, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 15, 1982, Ser. No. 441,756

Int. Cl.³ C08J *9/26, 9/28*

U.S. Cl. 521—62 **8 Claims**

1. A vesiculated pigment granule having a diameter of 1–50 microns, the granule comprising

(a) 1–60%, by weight, of TiO_2 particles in a matrix of an unsaturated polyester resin cross-linked with a polymerizable unsaturated monomer,

(b) 5–95%, by volume, of voids, and

(c) 0.5–4.0%, by weight of the TiO_2, of a phosphate ester represented by the structure

$$(R\text{-}[\text{-}O\text{—}(CH_2)_y\text{-}]_n O\text{-})_x PO_{4-x}Z_{3-x}$$

where

R is an aliphatic hydrocarbon radical of 4–16 carbon atoms, an octylphenol radical or a nonylphenyl radical,

n is 4–12,

x is 1 or 2,

y is 2 or 3, and

z is H, Na or K.

4,399,238

ALKALI METAL BOROHYDRIDE CONCENTRATE

Robert C. Wade, Ipswich, Mass., assignor to Thiokol Corporation, Chicago, Ill.

Continuation of Ser. No. 272,867, Jun. 12, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,320

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—82 **5 Claims**

1. A solid, substantially inert, and stable borohydride blowing agent concentrate mixture prepared from a dried alkali metal borohydride and a dried inert resinous polymer in which reactive protonic hydrogen atoms are substantially absent; said concentrate mixture consisting essentially of from about 0.5% to 20% by weight of said alkali metal borohydride, less than about 0.1% absorbed water, balance essentially said dry inert resinous polymer.

4,399,239

ELASTOMERIC, ETHYLENICALLY UNSATURATED POLYURETHANES AND RADIATION POLYMERIZABLE MIXTURES CONTAINING SUCH POLYURETHANES

Walter Herwig, Bad Soden; Kurt Erbes, Flörsheim; Rudolf Decker, Bodenheim, and Helga Sikora, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

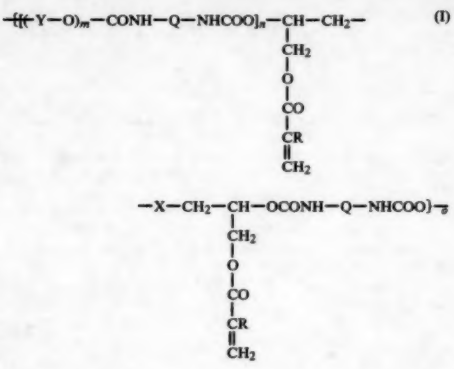
Division of Ser. No. 302,687, Sep. 15, 1981. This application Jul. 21, 1982, Ser. No. 400,351

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036694

Int. Cl.³ C08G *18/14, 18/32;* **C08L** *29/04;* **B32B** *37/40*

U.S. Cl. 521—137 **19 Claims**

1. A polyurethane corresponding to the formula:



(I)

wherein

Q is a divalent, mononuclear or dinuclear aromatic radical which is unsubstituted or is substituted by lower alkyl groups and which can contain, as a linking member, a lower alkylene group,

X is one of the groups —O—Ph—Z—Ph—O— and —OO-C—$(CH_2)_y$—COO—,

Ph being an optionally substituted phenylene group,

Z being an alkylene group having 1–4 carbons atoms, and

y being an integer from 2 to 12,

R is a hydrogen atom or a methyl group,

Y is an alkylene radical having 2–6 carbon atoms,

m is an integer from 4 to 50,

n is an integer from 1 to 6, and

o is an integer from 4 to 20.

19. A foamed elastomer body comprising a polyurethane according to claim 1.

4,399,240

REMOVAL OF ACRYLONITRILE FROM LATEX WITH SATURATED HETEROCYCLIC AMINES

Michael L. Senyek, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 30, 1981, Ser. No. 336,001

Int. Cl.³ C08K *5/35*

U.S. Cl. 523—332 **12 Claims**

1. An improved process for reducing the concentration of free acrylonitrile in an acrylonitrile polymer emulsion containing free acrylonitrile, comprising adding to said acrylonitrile polymer emulsion a saturated 6 to 7 membered ring heterocyclic amine wherein said ring contains at least one secondary amine moiety in amounts and under conditions sufficient to react with said free acrylonitrile to form a tertiary amino linkage.

4,399,241

BASE FOR A GRAFT POLYMER, NOVEL GRAFT POLYMER COMPOSITIONS, SOLVENTS AND WATER-REDUCIBLE COATINGS INCORPORATING THE NOVEL GRAFT POLYMERS, AND PROCESSES FOR MAKING THEM

Vincent W. Ting, Boulder, Colo.; James T. K. Woo, Medina, and Richard M. Marcinko, North Royalton, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,507
Int. Cl.³ C08L 63/02
U.S. Cl. 523—400 30 Claims

1. A process for making a fluent blend of an advanced epoxy resin and an extender polymer, said epoxy resin and said extender polymer each having aliphatic backbone carbon atoms that have either one or two carbon atoms bonded thereto, which comprises:

mixing an aromatic 1,2-epoxy resin, having an epoxy equivalent weight below about 2,000, with at least one extender polymer and with a sufficient amount of an organic solvent to render the mixture fluent, and then

advancing the epoxy resin in the presence of said extender polymer and said solvent, by reacting the epoxy resin with a polyfunctional compound that adds to the epoxy resin at its epoxide groups, to increase the molecular weight of the resin, which polyfunctional compound is either a polycarboxylic compound or a polyhydroxy compound,

maintaining sufficient solvent in the mixture that the blend of advanced epoxy resin and extender polymer remains fluent, and

polymerizing addition polymerizable monomer in the presence of said mixture by addition polymerization under addition polymerizing conditions.

4,399,242

AQUEOUS EPOXY-URETHANE DISPERSIONS

Hubert H. Fowler, Louisville, and Joe M. Hunter, Fern Creek, both of Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,979
Int. Cl.³ C08L 63/02, 75/04
U.S. Cl. 523—404 12 Claims

1. An epoxy dispersion composition comprising (1) an aqueous medium; (2) between about 50–70 weight percent of self-emulsifying epoxy resin which is the addition product of reactants comprising (a) 40–90 parts by weight of a diglycidyl ether of a dihydric phenol, (b) 5–35 parts by weight of a dihydric phenol, (c) 2–15 parts by weight of a diglycidyl ether of polyoxyalkylene glycol and (d) 2–6 weight percent based on the weight of (a), (b) and (c) of an organic diisocyanate which is aliphatic, cycloaliphatic or aromatic, and which contains no groups reactive with epoxy groups or hydroxyl groups other than isocyanate groups, wherein the molecular weight of the epoxy resin is in the range from about 800–20,000; (3) 1–25 weight percent, based on resin solids weight, of water-immiscible C_8–C_{20} aliphatic monoepoxide reactive diluent; and (4) 5–20 weight percent, based on resin solids weight, of water-miscible solvent selected from C_2–C_{10} glycols and glycol ethers.

4,399,243

CLEANER AND SCRATCH REMOVER COMPOSITION

Sunit S. Dixit, Naperville, and Daniel C. Thomas, Melrose Park, both of Ill., assignors to Richardson Graphics Company, Des Plaines, Ill.

Filed Dec. 12, 1980, Ser. No. 215,816
Int. Cl.³ B41M 1/06; C09D 3/20, 5/20; C08L 5/00
U.S. Cl. 524—55 26 Claims

1. A multifunctional cleaner, scratch remover, conditioner and finisher composition for treating imaged and developed lithographic plates, said composition being an emulsion of an oil phase and an aqueous phase comprising a water-in-oil emulsion including:

an oil phase including between about 13 and 17 weight percent of a highly penetrating solvent selected from the group consisting of mineral spirits, kerosene and lithotene, between about 5 and 10 weight percent of an oleophilic acid, between about 4 and 20 weight percent of an emulsifying surfactant, all based on the total weight of the emulsion composition; and

an aqueous phase including between about 0.05 and 0.5 weight percent of a hydrophilic synthetic resin desensitizer, between about 10 and 28 weight percent of a gum desensitizer, between about 0.1 and 2.5 weight percent of a desensitizing agent of phosphoric acid or derivatives thereof, between about 0.2 and 7 weight percent of an alkaline nitrate salt, and between about 32 and 45 weight percent water, all based upon the total weight of the emulsion composition.

4,399,244

GLASS FIBER REINFORCED POLYETHYLENE TEREPHTHALATE COMPOSITIONS HAVING IMPROVED HEAT DISTORTION TEMPERATURES

Peter Bier, New Martinsville, W. Va., assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,276
Int. Cl.³ C08K 5/34, 7/14; C08L 67/02
U.S. Cl. 524—89 6 Claims

1. A thermoplastic composition comprising:

(a) from 20 to 92% by weight of a polyethylene terephthalate having an intrinsic viscosity of at least 0.3 dl/g measured as a 0.5% by weight solution in a 1:1 mixture of phenol and tetrachloroethane at 25° C.,

(b) from 5 to 60% by weight of glass fibers, and

(c) from 3 to 20% by weight of an organic compound containing at least one imide group and having a melting point greater than 240° C.

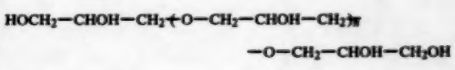
4,399,245

SIZING AGENT FOR SYNTHETIC FIBERS

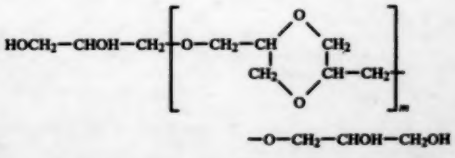
Rolf Kleber, Neu-Isenburg, and Herbert Stühler, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,302
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3107008
Int. Cl.³ C08K 5/15
U.S. Cl. 524—108 2 Claims

1. Sizing agent consisting substantially of a polyvinyl alcohol and from 5 to 30 weight % of a polyglycerol of the formulae



or



in which n is a number of from 2 to 13, and m is a number of from 1 to 7.

4,399,246

FILLED POLYAMIDE COMPOSITIONS WITH SILANES AND SULFONAMIDES

Thomas J. Hyde, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Aug. 6, 1982, Ser. No. 405,760
Int. Cl.³ C08L 77/06
U.S. Cl. 524—169 11 Claims

1. A composition consisting essentially of

(a) about 50 to 80 parts by weight of at least one polyamide having a number average molecular weight of at least 11,000,

(b) about 20 to 50 parts by weight of at least one mineral filler that is substantially anhydrous and has a mean average particle size of 2.0 micrometers or less,

(c) about 0.2 to 0.9 parts by weight of at least one aminofunctional silane, and

(d) about 0.2 to 0.9 parts by weight of at least one N-substituted hydrocarbyl sulfonamide.

4,399,247

ORGANOPOLYSILOXANE-CONTAINING COMPOSITION FOR TREATING SUBSTRATES

Isao Ona, Sodegaura; Masaru Ozaki, Ichihara; Katsutoshi Usui, Ichihara, and Yoichiro Taki, Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,301
Claims priority, application Japan, Jun. 26, 1981, 56-99453
Int. Cl.³ C08K 5/04, 5/09, 5/16; D06M 13/18
U.S. Cl. 524—204 6 Claims

1. A composition obtained by mixing components comprising

(A) 100 parts by weight of an organopolysiloxane component having the formula $R_aX_bY_cZ_dSiO_{(4-a-b-c-d)/2}$ wherein R denotes a monovalent hydrocarbon group; X denotes a group having the formula $-R^1(NHCH_2CH_2)_eNR_2^2$, wherein R^1 denotes a divalent hydrocarbon group, R^2 denotes a hydrogen atom or a monovalent hydrocarbon group and e is an integer from 0 to 3; Y denotes a group having the formula $-R^3OH$ or $-R_f^3O(C_mH_{2m}O)_gR^4$ wherein R^3 denotes a divalent hydrocarbon group, R^4 denotes a hydrogen atom or a terminating group, f is 0 or 1, g has a value of from 1 to 100 and m is an integer from 1 to 5; Z denotes a hydroxyl group or an alkoxy group; a has a value of from 1.90 to 2.20; b has a value of from 0.0001 to 0.2; c has a value of from 0.0001 to 0.2; d has a value of from 0 to 0.2 and the sum of a+b+c+d has a value of from about 1.90 to 2.20,

(B) 0 to 100 parts by weight of a nonionic or a cationic surfactant,

(C) 0.1 to 50 parts by weight of an organic ester of titanic, zirconic or germanic acid,

(D) an amount of acid sufficient to provide a pH of from 2.5 to 7.0 for the composition, and

(E) an amount of water effective to emulsify or dissolve component (A).

4,399,248

PLASTICIZER, PLASTICIZED RESIN COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Udai P. Singh, Rochester, N.Y., and John T. Lutz, Jr., Cornwells Heights, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 793,655, May 4, 1977, Pat. No. 4,184,993, which is a continuation-in-part of Ser. No. 680,544, Apr. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 614,462, Sep. 18, 1975, abandoned. This application Jul. 9, 1979, Ser. No. 55,581
The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.
Int. Cl.³ C08K 5/09, 5/10
U.S. Cl. 524—205 11 Claims

1. A blend of about 1 to 600 parts by weight of a plasticizer which is the free radical polymerization product of (A) one or more monoethylenically unsaturated hydrocarbons having 6 to 18 carbon atoms and (B) one or more C_1–C_6 esters of monoethylenically unsaturated monocarboxylic acids, or diesters of monoethylenically unsaturated dicarboxylic acids, the number average molecular weight being about 500 to 6000, the number ratio of (A) to (B) being about 0.1/1 to 1.5/1, with about 100 parts of different polymer.

4,399,249

RESEALABLE PRESSURE SENSITIVE ADHESIVES AND PRODUCTS

Leon L. Bildusas, Aurora, Ill., assignor to Eschem Inc., Chicago, Ill.

Filed Dec. 24, 1980, Ser. No. 220,116
Int. Cl.³ C08L 93/00; C08K 5/01; C08L 91/00, 9/00
U.S. Cl. 524—271 19 Claims

1. A resealable and releasable pressure sensitive adhesive composition comprising:

between about 20 and 60 weight percent based on the total weight of the composition of a block copolymer having non-elastomeric polymer blocks and at least one elastomeric polymer block, each said non-elastomeric block being a monoalkenyl arene polymer block, said elastomeric block being a hydrogenated conjugated diene polymer block;

between about 5 and 50 weight percent based on the total weight of the composition of an end block modifying resin that includes a monoalkenyl arene, said end block modifying resin being compatible predominantly with the non-elastomeric block and substantially incompatible with the elastomeric block;

between about 20 and 60 weight percent based on the total weight of the composition of a plasticizing process oil that is compatible predominantly with said elastomeric block and generally incompatible with the non-elastomeric block of the block copolymer; and

not more than 14 weight percent based on the total weight of the composition of a mid block modifying tackifying resin that is compatible predominantly with the elastomeric block and substantially incompatible with the non-elastomeric block of the block copolymer.

4,399,250

MATERIAL FOR TREATING COKE OVEN DOORS AND JAMBS TO PREVENT THE BUILD UP OF TAR THEREON

Micheal D. La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 181,123, Aug. 25, 1980, Pat. No. 4,316,831, which is a continuation-in-part of Ser. No. 49,349, Jun. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 905,513, May 15, 1978, abandoned. This application Nov. 6, 1981, Ser. No. 318,760
Int. Cl.³ C08L 23/00
U.S. Cl. 524—442 2 Claims

1. A normally liquid suspension material for forming sealing and lubricating adhesive coatings on coke oven doors and jambs subjected to coke oven operating temperatures and comprising between about 34% to 75% of a solution of water and a soluble silicate wherein the soluble silicate is present at about 40% by weight of the solution, between about 2% to 10% concentrated hydrochloric acid of 90% purity by weight, between about 33% to 75% of a solution of water and a carboxy polymethylene resin wherein the resin is present in amounts between 1% and 10% of the resin solution by weight and withstands said coke oven operating temperatures so that the material will remain in place on the doors and jambs of an operating coke oven.

4,399,251

COMPOSITIONS COMPRISING A THERMOPLASTIC RESIN AND AN OLEFIN MOLD RELEASE AGENT

Garland G. Lee, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 7, 1981, Ser. No. 327,946
Int. Cl.³ C08L 69/00
U.S. Cl. 524—481 20 Claims

1. A composition comprising a thermoplastic resin selected from the group consisting of aromatic carbonate polymer, polyester, polyarylate, copolyestercarbonate, polysulfone, polyethersulfone, polyamide, polysulfide, polyacrylate, polyurethane, polyvinylhalide, acrylonitrile butadiene styrene, butadiene styrene and methacrylate butadiene styrene and a mold release effective amount of a mono-olefin of from about fourteen to about forty-six carbon atoms inclusive.

4,399,252

METHOD OF EMPLOYING PROCESS OILS FROM CONVERTED WASTES IN SYNTHETIC RUBBERS

John J. Cunningham, Wayne, Pa., assignor to Petrocon Corporation, Valley Forge, Pa.

Filed Mar. 24, 1981, Ser. No. 247,202
Int. Cl.³ C08K 5/01
U.S. Cl. 524—484 3 Claims

1. A meethod of using previously used oil comprising treating said oil to remove water, low boiling point compounds, and solid contaminants therefrom to convert said previously used oil to a process oil having an aromatic content of at least 10 percent by weight and a flash point above 310° F., and incorporating said treated previously used oil as a process oil in a synthetic rubber composition.

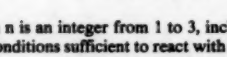
4,399,253

NOVEL METHOD OF REMOVING RESIDUAL ACRYLONITRILE FROM LATEX SYSTEMS

Richard R. Lattime, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 23, 1981, Ser. No. 323,527
Int. Cl.³ C08L 55/00
U.S. Cl. 524—565 32 Claims

1. An improved process for preparing an acrylonitrile polymer latex containing an in situ antioxidant and for reducing the concentration of free acrylonitrile in an acrylonitrile polymer emulsion containing free acrylonitrile, comprising adding to said acrylonitrile polymer emulsion a thiol selected from the group consisting of thiol substituted paraffins and thiol substituted aromatic hydrocarbons wherein at least one thiol substituent has the general structural formula:



and wherein n is an integer from 1 to 3, inclusive, in amounts and under conditions sufficient to react with said free acrylonitrile.

4,399,254

CATIONIC LATICES USEFUL FOR THERMOPLASTIC AND THERMOSETTING APPLICATIONS

Suryya K. Das, Pittsburgh, and Charles M. Kania, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 25, 1981, Ser. No. 305,590
Int. Cl.³ C08K 5/41
U.S. Cl. 524—745 3 Claims

1. A process for preparing a stable cationic acrylic latex; said process comprises copolymerizing ethylenically unsaturated monomers in an acidic medium in the presence of a cationic surfactant in which the gegen-ion of the cationic surfactant is derived from methanesulfonic acid.

2. A process of claim 1, wherein at least one of the ethylenically unsaturated monomers is amino group-containing.

4,399,255

ALLOY RAYON FIBERS OF REGENERATED CELLULOSE AND COPOLYMERIC ACRYLIC ACID SALTS

Frederick R. Smith, Toms Brook, Va.; Walter W. Toy, Lansdale, and David Witiak, Yardley, both of Pa., assignors to Avtex Fibers Inc., Valley Forge and Rohm & Haas Co., Philadelphia, both of, Pa.

Continuation-in-part of Ser. No. 219,134, Dec. 22, 1980, abandoned. This application Sep. 10, 1982, Ser. No. 416,760
Int. Cl.³ C08L 1/02; A61F 13/20; D01D 5/22
U.S. Cl. 525—54.21 22 Claims

1. Alloy rayon fiber comprising regenerated cellulose and an at least partially neutralized copolymer of (a) at least one acid monomer selected from acrylic acid and methacrylic acid, and (b) at least one comonomer selected from hydroxyalkyl C_2–C_6) esters of said acids and a styrenic comonomer, the monomer ratio (a:b) in the copolymer ranging from 95:5 to 50:50 by weight, said copolymer being present in an amount effective to provide a measurable fluid holding capacity increase for the alloy fiber.

4,399,256

SURFACE-COATING BINDERS CONTAINING BLOCKED ISOCYANATE GROUPS, AND THEIR USE IN CATHODIC ELECTROCOATING

Jürgen Gimpel; Karl-Heinz Feuerherd, both of Ludwigshafen, and Hans-Uwe Schenck, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,919
Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017603
Int. Cl.³ C08L 63/00
U.S. Cl. 525—111 7 Claims

1. A surface-coating binder based on a copolymer which contains tertiary amino groups, blocked isocyanate groups, hydroxyl groups and ether groups and which, due to partial or complete salification with an acid, is water-soluble or water-dispersible, and wherein the copolymer contains, as copolymerized units,

(A) from 6 to 22% by weight of one or more olefinically unsaturated compounds containing a tertiary amino group,

(B) from 10 to 35% by weight of vinyl isocyanate or propenyl isocyanate blocked with a CH—, OH— or NH-acidic blocking agent,

(C) from 20 to 50% by weight of an adduct of an epoxy resin, based on bisphenol A and epichlorohydrin and having a molecular weight of from 380 to 3,500, with an olefinically unsaturated alcohol of 3 to 20 carbon atoms,

(D) from 10 to 64% by weight of one or more copolymerizable olefinically unsaturated compounds not already mentioned under (A) to (C), with the proviso that the copolymer has a mean molecular weight of from 1,000 to 20,000 and that the sum of the percentages of (A) to (D) is 100.

4,399,257

EPOXY RESIN COMPOSITION

Yoshihiro Kitsuda, Hirakata; Masaaki Ohtsu, Habikino, and Masahiro Matsumura, Katano, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 8, 1981, Ser. No. 261,908
Claims priority, application Japan, May 10, 1980, 55-62101; Oct. 30, 1980, 55-153341; Oct. 30, 1980, 55-153342; Dec. 13, 1980, 55-176106
Int. Cl.³ C08L 29/02, 63/00
U.S. Cl. 525—118 12 Claims

1. An epoxy resin composition consisting of:

an epoxy resin having at least two epoxy groups per molecule mixed with a first compound or a mixture thereof selected from the group consisting of poly-p-vinyl phenol and its halides wherein compounding quantity of said first compound or mixture is within the range of 0.5 to 2.0 in molar ratio of (epoxy group of epoxy resin composition)-/(active hydrogen of said first compound or mixture) and a second compound selected from the group consisting of:

(a) Sn salt of organic acid, wherein at least one organic group is bonded with Sn atom;

(b) silane compound containing alcoxy group, represented by the following general formula,

$$(R'-)_n-Si-(-OR)_{4-n}$$

wherein, R' denotes an alkyl group or an allyl group, R denotes a normal chain or branched alkyl group, and n denotes 0 or an integer of 1–4,

(c) aluminic acid ester, represented by the following general formula,

$$[Al(OR)_3]_n$$

wherein, n denotes an integer of 1–5, and R denotes an alkyl group or an allyl group.

4,399,258

POLYALKENE HAVING IMPROVED DYEABILITY MODIFIED WITH POLYAMIDE

Adriën G. Hinze, Dordrecht; Robert P. Roggeveen, and Abraham J. Meulenberg, both of Gouda, all of Netherlands, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 141,235, Apr. 17, 1980, Pat. No. 4,341,670. This application Jan. 21, 1982, Ser. No. 341,400

Int. Cl.³ C08L 23/04

U.S. Cl. 525—184 **4 Claims**

1. A polyalkene composition having improved dyeability which contains 0.5 to 10 wt. percent of a solid polyamide having an acid value of less than 10 and amine value from 75 to 150 and consisting essentially of repeating groups obtained from

(a) an aliphatic diamine having 2 to 3 carbon atoms between the nitrogen atoms;

(b) a triamine having the formula

$$H_2N-R_1-\underset{\displaystyle R_2}{\overset{\displaystyle |}{N}}-R_3-NH_2$$

in which R_1, R_2 and R_3 are saturated hydrocarbon radicals containing from 1 to 6 carbon atoms;

(c) an aliphatic dicarboxylic acid having from 6 to 19 carbon atoms; and

(d) a polymeric fatty acid obtained by the polymerization of a C_{16-22} unsaturated fatty acid;

the molar ratio of (a) to (b) ranging from 0.4:1 to 1.5:1 and the polymeric fatty acid being present in an amount up to 35 mol percent of the total dicarboxylic acids.

4,399,259

PHOTOCROSSLINKABLE POLYMERS WITH SIDE GROUPS DERIVED FROM INDENONE AND THE PREPARATION AND USE OF THESE POLYMERS

Hans Zweifel, Basel; Joseph Berger, Marly, and Hans Bosshard, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

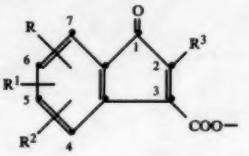
Continuation of Ser. No. 113,834, Jan. 21, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,521

Claims priority, application Switzerland, Jan. 30, 1979, 886/79

Int. Cl.³ C08F 8/14

U.S. Cl. 525—289 **9 Claims**

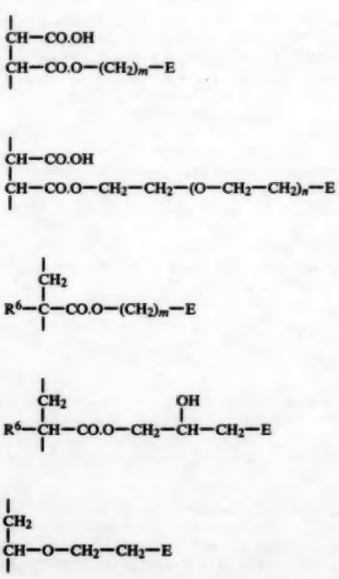
1. A polymer, crosslinkable under the action of light, which has an average molecular weight between 1,000 and 1,000,000, as measured by the intrinsic viscosity of a solution of said polymer in N,N-dimethylformamide at 20° C., and which has side groups of the formula I



(I)

in which R^3 is Cl or Br, and R, R^1 and R^2 are identical or different and R is a n-alkyl radical having 1 to 4 C atoms, or is H, Cl, Br or F, R^1 is a n-alkyl radical having 1 to 4 C atoms, or is H, and R^2 is H or CH_3, or R^1 and R^2 together are the group $—CH_2CH_2CH_2—$, with the proviso that in the latter case the bond to the six-membered ring is via the C atoms in the 5-position and 6-position of the nucleus, the proportion of groups of the formula I being at least 5%, based on the number of recurring structural elements of the polymer, said polymer being a homopolymer or copolymer derived from monomers containing reactive C=C double bonds, wherein said polymer comprises

(a) from 5 to 100 percent, based on the number of recurring structural elements in the polymer chain, or molecular chain members selected from the group consisting of formulas II to VI.



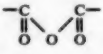
in which the radical E has the formula I, m is a number from 2 to 6, n is a number from 1 to 10 and R^6 is H or $—CH_3$, and

(b) from 95 to 0 percent, based on the number of recurring structural elements in the polymer chain, of structural elements of the formula IX

(IX)

in which X_1 and X_3 are each hydrogen, X_2 is hydrogen, chlorine or methyl and X_4 is hydrogen, methyl, chlorine, —CN, —COOH, phenyl, methylphenyl, methoxyphenyl, cyclohexyl, —COO—alkyl having 1–12 C atoms in the alkyl moiety, —COO—phenyl,

—COO—alkyl—OH having 1–3 C atoms in the alkyl moiety, —OCO—alkyl having 1–4 C atoms in the alkyl, —OCO—phenyl, —CO—alkyl having 1–3 C atoms in the alkyl, alkoxy having 1–6 C atoms or phenoxy, or X_1 and X_2 are each hydrogen and X_3 and X_4 together are the grouping



or are each —COOH or —COO—alkyl having 1–6 C atoms in the alkyl.

4,399,260

INCREASING THE REACTIVITY OF COUPLING OF BLOCK POLYMERS

William G. Carson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 4, 1982, Ser. No. 337,037
Int. Cl.³ C08F 8/40
U.S. Cl. 525—340 **10 Claims**

1. A process for the preparation of thermoplastic block polymers which comprises contacting conjugated diolefinic monomers selected from the group consisting of isoprene, piperylene, 2-ethyl-1,3-butadiene, 2,3-dimethyl-1,3-butadiene and 1,3-butadiene, mixed with at least one polyvinyl aromatic coupling compound selected from the group consisting of o, m and p-divinylbenzene, 1,2,4-trivinylbenzene, 1,8-divinylnaphthalene, 1,2-divinyl-3,4-dimethylbenzene, 2,4-divinylbiphenyl, 3,5,4'-trivinylbiphenyl and 1,3,5-trivinylbenzene under solution polymerization conditions with a polystyryllithium catalyst which has been prepared by reacting an alkyllithium compound with a styrene monomer selected from the group consisting of styrene, alpha-methylstyrene, p-methylstyrene, p-t-butylstyrene, 3-methylstyrene, 1-vinylnaphthalene, in which an amount of polyvinyl aromatic coupling compound ranges from about 1.0 to about 6 vinyl groups of the polyvinyl aromatic coupling compound per mole of active lithium catalyst used, to produce a living polymer and then subsequently contacting said living polymer with (a) a polar compound selected from the group consisting of ethylene glycol dimethyl ether, diethylene glycol dimethyl ether, triethylene glycol dimethyl ether, tetraethylene glycol dimethyl ether, 2,3-dimethyoxybutane, N,N,N',N'-tetramethylethylenediamine, tri-n-butylphosphine and hexamethylphosphoric triamide, in which the molar ratio of the said polar compounds to the active lithium, based on the amount of said polystyryllithium catalyst present at the start of the polymerization, ranges from about 0.01/1 to about 20/1 or (B) a polar compound selected from the group consisting of tetrahydrofuran, diethyl ether, triethylamine, 1,4-diazabicyclo-2.2.2-octane, p-dioxane, tri-n-butylamine and N,N'-dimethylpiperazine, in which the molar ratio of the said polar compounds to the active lithium, based on the amount of said polystyryllithium catalyst present at the start of the polymerization, ranges from about 0.5/1 to about 100/1.

4,399,261

CURABLE COMPOSITION

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1981, Ser. No. 328,910
Claims priority, application Japan, Dec. 19, 1980, 55/181147
Int. Cl.³ C08F 8/32
U.S. Cl. 525—342 **11 Claims**

1. A curable composition comprising a blend consisting essentially of (A) a silyl group containing vinyl resin having a main chain consisting essentially of vinyl polymer and in one molecule at least one silicon atom connected to a hydrolyzable group on terminal or side chain; (B) a tin compound; and (C) an amine or a mixture of two or more amines having in one molecule at least one silicon atom connected to a hydrolyzable group, wherein said vinyl resin comprises 100 parts by weight; said tin compound comprises 0.01 to 10 parts by weight; and said amine or mixture of amines comprises 0.01 to 20 parts by weight.

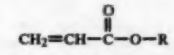
4,399,262

ACRYLATE RUBBER COMPOSITIONS

Dane E. Jablonski, Brunswick, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 12, 1982, Ser. No. 367,209
Int. Cl.³ C08F 4/50
U.S. Cl. 525—349 **9 Claims**

1. A composition comprising (1) an acrylate rubber containing (a) from about 40 percent to about 98 percent by weight of an acrylate of the formula



wherein R is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl, an alkylthioalkyl, and a cyanoalkyl radical containing 2 to about 12 carbon atoms, (b) from about 0.1 percent to about 30 percent by weight of a halogen-containing monomer selected from the group consisting of halogen-containing vinylene hydrocarbons and halogen-containing vinyl monomers having the halogen group at least two carbon atoms removed from an oxygen atom, (c) from about 0.1 percent to about 20 percent by weight of an unsaturated carboxyl-containing monomer, and (d) up to 35 percent by weight of a copolymerizable monomer containing a terminal vinylidene group, and (2) as the curative, vulcanizing amounts of 2,5-dimercapto-1,3,4-thiadiazole and a Group IB, IIB, IVA, VA or VIA metal salt of a tetraalkyl thiuram sulfide.

4,399,263

MODIFICATION OF ETHYLENE/ACRYLATE/CARBOXYLIC POLYMER

Nicolas Brodoway, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 24, 1981, Ser. No. 334,160
Int. Cl.³ C08F 8/30
U.S. Cl. 525—382 **6 Claims**

1. A process for increasing the hydrolytic stability and uniformity, and optionally increasing the molecular weight of random ethylene/methyl acrylate/1,4-butenedioic acid ester copolymer, said copolymer containing 0.5–10 weight percent 1,4-butenedioic acid ester, 40–62 weight percent methyl acrylate, and 28–59.5 weight percent ethylene, said process comprising heating said copolymer to a temperature of 140°–200° C. for a period of at least five minutes, and then contacting the heated copolymer in which the anhydride content is about 0.01–0.1 mole/kg of said heated copolymer with 0.01–0.1 equivalents of amine per kilogram of polymer wherein the amine consists of carbon, hydrogen and nitrogen atoms and is

selected from the group consisting of monamines, polyamino compounds, compounds which generate such monoamines and polyamino compounds upon chemical reaction, and mixtures of the above.

4,399,264

PERFLUORODIOXOLE AND ITS POLYMERS

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 19, 1981, Ser. No. 323,096
Int. Cl.³ C08F 14/18, 14/22, 14/26
U.S. Cl. 526—247 9 Claims

1. A copolymer of perfluoro-1,3-dioxole selected from the group consisting of dipolymers of perfluoro-1,3-dioxole with fluoroolefins and terpolymers of perfluoro-1,3-dioxole with tetrafluoroethylene and with another ethylenically unsaturated monomer.

2. A dipolymer of claim 1, which is an amorphous copolymer of perfluoro-1,3-dioxole with tetrafluoroethylene.

3. A dipolymer of claim 1, which is a crystalline copolymer of perfluoro-1,3-dioxole with tetrafluoroethylene.

6. A copolymer of claim 1 selected from the group consisting of dipolymer of perfluoro-1,3-dioxole with vinylidene fluoride and terpolymer of perfluoro-1,3-dioxole with tetrafluoroethylene and vinylidene fluoride.

7. A homopolymer of perfluoro-1,3-dioxole.

4,399,265

PROCESS OF PRODUCTS UV-STABILIZED POLYESTER MATERIALS

Shashikant B. Garware, and Ramaswamy Ananthanarayanan, both of Bombay, India, assignors to Garware Plastics & Polyester Ltd., Bombay, India

Filed Jan. 19, 1983, Ser. No. 459,050
Int. Cl.³ C08G 63/16
U.S. Cl. 528—308.2 18 Claims

1. The process of producing UV-stabilized polyester materials which comprises:

(1) heating polyester granules to a temperature of about 150°-180° C.;

(2) mixing a powdered UV-stabilizing substance with said heated granules, thereby producing polyester granules to which said powdered substance is attached;

(3) then subjecting said powder-carrying granules to a drying step effective to reduce the moisture content thereof to no more than about 0.005% by weight; and

(4) then forming said dried powder-carrying granules into a useful body, such as a film, sheet, ribbon or filament.

2. The process of claim 1, in which said polyester comprises polyethylene terephthalate.

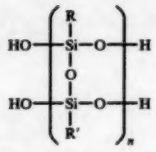
4,399,266

LADDERY LOWER ALKYLPOLYSILSESQUIOXANE HAVING HEAT-RESISTANT THIN FILM-FORMABILITY AND PROCESS FOR PREPARING SAME

Yoshio Matsumura, Yamato; Ikuo Nozue, Yokohama; Osahiko Tomomitsu, Yokohama; Takashi Ukachi, Yokohama, and Taro Suminoe, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 294,218, Aug. 19, 1981, abandoned. This application Mar. 2, 1982, Ser. No. 353,811
Claims priority, application Japan, Aug. 26, 1980, 55-116493; Jul. 17, 1981, 56-110736; European Pat. Off., Aug. 26, 1981, 81303911.2
Int. Cl.³ C08G 77/00
U.S. Cl. 528—10 28 Claims

1. A laddery lower alkylpolysilsesquioxane having a heat resistant thin film-formability represented by the formula:



wherein R and R′ represent same or different lower alkyl groups, and n is an average degree of polymerization, characterized in that 15 to 30% by weight of the laddery lower alkylpolysilsesquioxane is occupied by the low molecular weight portion having a standard polystyrene-reduced molecular weight of 20,000 or less as measured by gel permeation chromatography.

4,399,267

ORGANOPOLYSILOXANES HAVING RETARDED SKIN FORMATION

Erhard Bosch, Burghausen; Ingo Craubner, Munich; Norman Dorsch, Burghausen; August Schiller, Neuötting, and Oswin Sommer, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,809
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133564
Int. Cl.³ C08G 77/22
U.S. Cl. 528—30 12 Claims

1. A composition which is stable when stored under anhydrous conditions, but when exposed to atmospheric moisture cures to an elastomer comprising

(a) a diorganopolysiloxane containing terminal condensable groups;

(b) a silicon compound having at least 3 groups per molecule selected from the group consisting of amino groups which are bonded to silicon via nitrogen, oxime groups which are bonded to silicon via oxygen and mixtures thereof; and

(c) a silicon compound having at least one thiol group per molecule bonded to silicon via carbon.

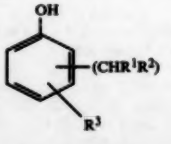
4,399,268

PROCESS FOR PREPARING MOULDED BODIES AND COATINGS

Wilhelm Becker, Hamburg; Herbert Hübner, Burgkirchen, and Manfred Marten, Hamburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,687
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023464
Int. Cl.³ C08G 59/50, 59/62
U.S. Cl. 528—99 6 Claims

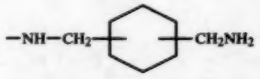
1. A process for the preparation of molded bodies and coatings which comprises reacting at least one epoxy compound containing more than one 1,2-epoxy group per molecule alone or in combination with at least one mono-epoxide, with at least one substituted amine of formula



(I)

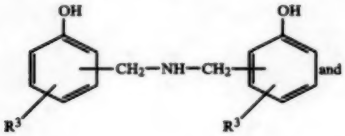
being free from other phenols and in which R^1 is hydrogen or methyl, R^2 is a radical of at least one of formulae

and



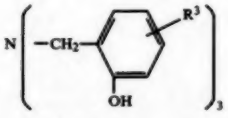
and R^3 is hydrogen, a hydroxy group, a carboxylic group or methyl, which amine has a content of phenolic OH— groups of at least 6.3% by weight and is reacted in an amount being at least equivalent to the epoxy groups in the epoxy resin and at most in an excess of up to 50 mol%, said amine (I) having been obtained by reaction of (A) a substance selected from the group consisting of least one xylylenediamine, and hydrogenation product thereof in the form of bis-(aminomethyl)-cyclohexanes according to one of the following processes with (Ba) a hydroxybenzaldehyde or a hydroxyacetophenone in a first step to form a Schiff's base and followed by a hydrogenation of said base in a second step to form a compound of formula (I), (Bb) a dimethylaminomethylphenol or with the corresponding cresol derivative or with at least one Mannich base, each of them being free from other phenols but derived from at least one phenol, formaldehyde and such primary monoamines, the aliphatic α-carbon atom of which is bound to at least two aliphatic carbon atoms of hydrocarbon groups, and/or substitution products thereof, the substituent of which is inert towards the reaction, splitting off and therefore substituting completely or to a large extent the dimethylamine group or the primary monoamine component of the Mannich base by the component (A) to yield a compound of formula (I), and (Bc) at least one phenol-hexamethylenetetramine condensation product of at least one of the formula

(IV)



and

(V)



said products being free from other phenols, splitting off and therefore substituting ammonia by component (A) to form a compound of formula (I).

4,399,269

POLY-(-2-AMINOALKYL)POLYAMINES

Edward W. Kluger, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

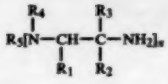
Division of Ser. No. 260,148, May 4, 1981, Pat. No. 4,362,894. This application Jul. 6, 1982, Ser. No. 395,435

Int. Cl.³ C08G 59/50

U.S. Cl. 528—123 **7 Claims**

1. An epoxy resin composition comprising an epoxy resin and at least one epoxy resin curing agent of the formula:

(II)



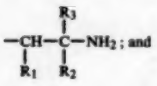
(III) wherein:

n is an integer of from 3 to about 12;

R_1 is selected from H and an alkyl group containing from 1 to about 10 carbon atoms;

R_2 and R_3 are each independently selected from H and a lower alkyl group containing from 1 to about 6 carbon atoms;

R_4 is selected from H and



; and

R_5 is selected from an alkyl group containing from about 6 to about 25 carbon atoms.

4,399,270

FIBER-FORMING POLYESTERS OF KETODIOLS

August H. Frazer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 29, 1982, Ser. No. 402,858

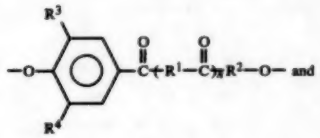
Int. Cl.³ C08G 63/06, 63/18

U.S. Cl. 528—125 **16 Claims**

1. Fiber-forming melt-spinnable polyester that is optically anisotropic in the melt and consists essentially of, respectively:

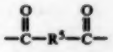
A. substantially equimolar amounts of the recurring units

(a)

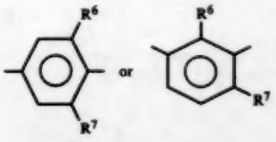


and

(b)



wherein R^1 is m-phenylene or p-phenylene R^2 is

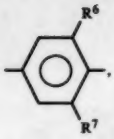


each of R^3, R^4, R^6 and R^7 is independently selected from H, CH_3 and Cl;

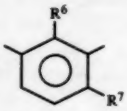
R^5 is m-phenylene, p-phenylene, ethylenedioxybis-p-phenylene or p,p'-biphenylene; and

n is 0 or 1; provided, however:

(aa) when n is 0, R^2 is

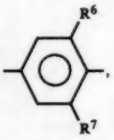


R^3 and R^4 or R^6 and R^7 are both Cl and R^5 is p-phenylene or ethylenedioxybis-p-phenylene, or R^2 is



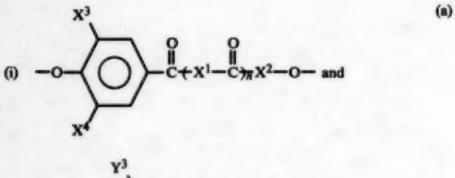
R^3, R^4, R^6 and R^7 and H and R^5 is ethylenedioxybis-p-phenylene; and

(bb) when n is 1, R^1 is m-phenylene, R^2 is



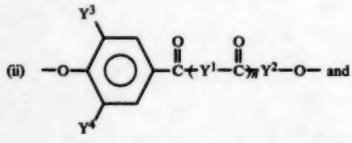
R^5 is ethylenedioxybis-p-phenylene or p,p'-biphenylene, one of R^3 and R^4 is CH_3 or Cl and the other is H, and one of R^6 and R^7 is CH_3 or Cl and the other is H; and

B. the recurring units

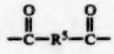


(a)

(i) —O— and



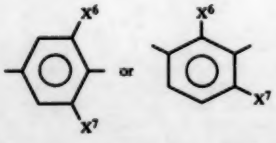
(ii) —O— and



(b)

wherein each of X^1 and Y^1 is independently selected from m-phenylene and p-phenylene;

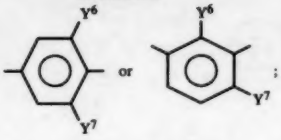
X^2 is



or

-continued

Y^2 is



each of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 is independently selected from H, CH_3 and Cl;

R^5 is m-phenylene, p-phenylene, ethylenedioxybis-p-phenylene or p,p'-biphenylene; and

n is 0 or 1, each of the recurring units (i) and (ii) comprising 40 to 60 mol % of their combined amounts which is substantially equimolar with the amount of (b), provided, however:

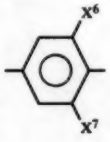
(aa) when n is 0 and one of X^2 and Y^2 is attached at the p-phenylene positions and the other is attached at the m-phenylene positions, then X^3, X_4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 are H and R^5 is p-phenylene or ethylenedioxybis-p-phenylene;

(bb) when n is 0 and X^2 and Y^2 are both attached at the p-phenylene positions, 1 or 2 of X^3, X^4, X^6 and X^7 and 1 or 2 of Y^3, Y^4, Y^6 and Y^7 are independently selected from CH_3 and Cl, the remaining 2 or 3 of X^3, X^4, X^6 and X^7 and the remaining 2 or 3 of Y^3, Y^4, Y^6 and Y^7 are H, and R^5 is m-phenylene, p-phenylene or ethylenedioxybis-p-phenylene;

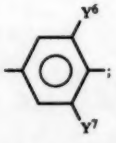
(cc) when n is 0, X^2 and Y^2 are both attached at the p-phenylene positions, and either X^3, X^4, X^6 and X^7 are each independently selected from CH_3 and Cl and Y^3, Y^4, Y^6 and Y^7 are H or X^3, X^4, X^6 and X^7 are H and Y^3, Y^4, Y^6 and Y^7 are each independently selected from CH_3 and Cl, then R^5 is m-phenylene.

(dd) when n is 0 and X^2 and Y^2 are both attached at the m-phenylene positions, 1 or 2 of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 are independently selected from CH_3 and Cl, the remaining 6 or 7 of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 are H, and R^5 is is p-phenylene or ethylenedioxybis-p-phenylene;

(ee) when n is 1, X^2 is



and Y^2 is



(ff) when n is 1 and X^1 and Y^1 are both m-phenylene, 6 of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 are independently selected from CH_3 and Cl, the remaining 2 of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 are H, and R^5 is p,p'-biphenylene; and

(gg) when n is 1 and one of X^1 and Y^1 is m-phenylene and the other is p-phenylene, each of X^3, X^4, X^6, X^7, Y^3, Y^4, Y^6 and Y^7 is independently selected from CH_3 and Cl, or one of each pair of X^3 and X^4, X^6 and X^7, Y^3 and Y^4 and Y^6 and Y^7 is independently selected from CH_3 and

Cl and the other of each pair is H, and R^5 is p,p'-biphenylene.

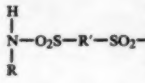
4,399,271

NONHALOGENATED FLAME RESISTANT SULFONYL AMIDE COPOLYCARBONATE

John R. Sanderson, Austin, Tex., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 30, 1981, Ser. No. 288,704
Int. Cl.³ C08G 63/62
U.S. Cl. 528—172 13 Claims

1. A thermoplastic aromatic copolycarbonate resin comprising the polymeric reaction product of (i) at least one aromatic diphenol (ii) a carbonate precursor, and (iii) a sulfonylamide compound conforming to the formula



wherein R and R' independently are organic radicals.

4,399,272

PROCESS FOR PRODUCING POLYACETAL COPOLYMERS

Hisaya Sakurai; Minoru Hamada; Kazuhiko Matsuzaki, and Muneaki Aminaka, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1980, Ser. No. 204,085
Claims priority, application Japan, Nov. 15, 1979, 54/148087; Nov. 15, 1979, 54/148088; Dec. 31, 1979, 54/172642; Feb. 12, 1980, 55/15778; Apr. 10, 1980, 55/47133
Int. Cl.³ C08G 2/18, 2/22, 2/24
U.S. Cl. 528—233 31 Claims

1. A process for producing a polyacetal copolymer, which comprises: copolymerizing formaldehyde and a compound selected from the group consisting of alkylene oxides, poly (alkylene oxides), cyclic formals and poly(cyclic formals) in the presence of an effective copolymerizing amount of a Lewis acid and an anionic polymerization catalyst with the exception of metal chelate compounds, wherein copolymerization is conducted in a reaction medium and said Lewis acid and said anionic polymerization catalyst coexist in said reaction medium while retaining copolymerization activity.

4,399,273

PROCESS FOR THE REMOVAL OF RESIDUAL MONOMERS FROM ABS POLYMERS

Gert Humme, Odenthal-Gloebusch; Horst Plato; Karl-Heinz Ott, both of Leverkusen; Friedrich Kowitz, Dormagen, and Peter Hagenberg, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 127,742, Mar. 6, 1980, abandoned. This application Jun. 23, 1981, Ser. No. 276,473
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909518
Int. Cl.³ C08F 6/16, 6/22
U.S. Cl. 528—486 1 Claim

1. Process for recovering ABS polymers from a latex prepared by emulsion polymerization with simultaneous removal of residual monomers, which consisting essentially of:

(a) adding to the latex 0.1 to 10% by weight, based on the solids content, of an electrolyte selected from acids and salts,

(b) simultaneously heating the mixture to about 55° to 120° C. to cause coagulation, and

(c) then distilling off part of the water, together with the residual monomers thereby removing residual monomers.

4,399,274

ISOLATION OF NON-IONIC LIPOPHILIC MATERIALS ON MACRORETICULAR POLYMERIC ABSORBENTS

Robert T. Goegelman, Linden, and Laszlo R. Treiber, Gillette, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 2, 1981, Ser. No. 279,633
Int. Cl.³ C07H 17/08
U.S. Cl. 536—7.1 1 Claim

1. A process for isolating or separating avermectin compounds from the aqueous fermentation broth that produced such compounds, which comprises:

preparing a mycelial extract by adding acetone to the fermentation broth to from 40 to 60% by volume of the original broth to form a mycelial extract:

treating the aqueous-acetone mycelial extract with an insoluble synthetic resin which is an addition copolymer having a cross linked structure to selectively absorb the avermectin compounds into the resin: and

eluting the resin with an aqueous acetone mixture in excess of 60% acetone to remove the avermectin compounds from the resin.

4,399,275

PREPARATION OF HIGHLY REACTIVE CELLULOSE

Karl D. Sears, Shelton, Wash., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 6, 1982, Ser. No. 337,447
Int. Cl.³ C08B 3/06
U.S. Cl. 536—70 9 Claims

1. A process for the preparation of cellulose acetate from highly reactive cellulose comprising

mercerizing cellulosic material,

reacting the mercerized cellulose with an hydroxyalkylating agent to a degree of substitution of the cellulose ranging from 0.05 to 0.3, said degree of substitution being insufficient to render said cellulose appreciably soluble in water,

recovering the highly reactive substantially water insoluble cellulose reaction, and acetylating said cellulose reaction product.

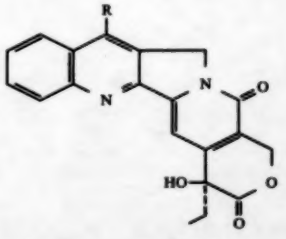
4,399,276

7-SUBSTITUTED CAMPTOTHECIN DERIVATIVES

Tadashi Miyasaka, Yokohama; Masahiko Mutai, Higashiyamato; Seigo Sawada, Tokyo, and Kenichiro Nokata, Mitaka, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,494
Claims priority, application Japan, Jan. 9, 1981, 56-1148; Jan. 9, 1981, 56-1149; May 7, 1981, 56-67594
Int. Cl.³ C07D 491/22
U.S. Cl. 542—416 22 Claims

1. A 7-Substituted camptothecin derivative of the formula:



(I)

wherein R represents —CHO, —CH_2OR', —$CH(OR')_2$ or —CH=N—X where R' is a lower alkyl group with 1–6 carbon atoms or a phenylalkyl group with 1–3 carbon atoms in the alkylene moiety thereof, and X is a hydroxyl group or —NR^1R^2 wherein R^1 and R^2 are the same or different and each

represents a hydrogen atom or a lower alkyl group with 1–6 carbon atoms, or when R^1 is hydrogen, R^2 may be a lower alkyl group with 1–6 carbon atoms, phenyl, a phenyl group substituted by one or more nitro groups, lower alkyl groups or halogen atoms, a carbamoyl group, an acyl group derived from aliphatic carboxylic acids with 1–6 carbon atoms or benzoic acid which may be substituted by a lower alkyl group, alkoxy group, nitro group and/or halogen atoms, isonicotinoyl, a linear or branched aminoalkyl group of 1 to 6 carbon atoms or an amidino group, or when R^1 is a lower alkyl group, R^2 may be an aminoalkyl group, or when R^1 and R^2 are each a lower alkyl group they may be combined together to form an alkylene group and may form a 5-membered or 6-membered heterocyclic group together with the nitrogen atom to which R^1 and R^2 are bound, or non-toxic acid-addition salts or non-toxic alkyl halide quaternary salts thereof.

4,399,277

7-AMINO-3-PHOSPHONOCEPHALOSPORANIC ACID COMPOUNDS

Takao Takaya, Kawanishi, and Toshiyuki Chiba, Osaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

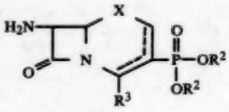
Division of Ser. No. 119,437, Feb. 7, 1980, Pat. No. 4,291,031. This application Mar. 20, 1981, Ser. No. 245,718

Claims priority, application United Kingdom, Feb. 19, 1979, 7905790

Int. Cl.³ C07D *501/18*

U.S. Cl. 544—016 **5 Claims**

1. A compound of the formula:



wherein R^2 is hydrogen or lower alkyl, R^3 is carboxy or a protected carboxy group, X is —S— or

and the dotted line bridging the 2 to 4-positions of the formula indicates that the compound may be the 2 or 3-cephem derivative, and pharmaceutically acceptable salts thereof.

4,399,278

3,7-DISUBSTITUTED-2 OR 3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Ikuo Ueda, Toyonaka; Masakazu Kobayashi; Hisashi Yamada, both of Ikeda, and Hiroki Ono, Nagaokakyo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

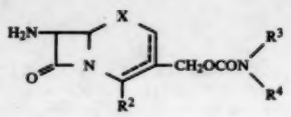
Division of Ser. No. 85,684, Oct. 17, 1979, Pat. No. 4,327,093. This application Feb. 26, 1982, Ser. No. 353,000

Claims priority, application United Kingdom, Oct. 24, 1978, 41754/78

Int. Cl.³ C07D *501/18*

U.S. Cl. 544—022 **5 Claims**

1. 7-Amino-2 or 3-cephem-4-carboxylic acid compounds of the formula:



wherein R^2 is carboxy or carboxy protected by a pharmaceutically acceptable group;

is di(lower)alkylamino(lower)alkylamino, an unsaturated or saturated 3 to 8 membered heteromonocyclic(lower)alkylamino group containing 1 to 4 nitrogen atoms, an unsaturated or saturated 3 to 8 membered heteromonocyclic(lower-)alkylamino group containing 1 to 4 nitrogen atoms substituted by lower alkyl or hydroxy(lower)alkyl, an unsaturated or saturated 5 to 6 membered heteromonocyclic group containing 2 to 4 nitrogen atoms, an unsaturated or saturated 5 to 6 membered heteromonocyclic group containing 2 to 4 nitrogen atoms substituted by lower alkyl or hydroxy(lower)alkyl or hydroxypiperidino, and X is —S— or

and pharmaceutically acceptable salts thereof.

4,399,279

4H-1,4-BENZOTHIAZINE DERIVATIVES AND INTERMEDIATES THERETO

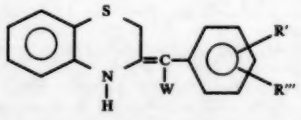
Robert J. Chorvat, Arlington Heights; Bipinchandra N. Desai, Vernon Hills, and Suzanne E. Radak, Wheeling, all of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Division of Ser. No. 241,984, Mar. 9, 1981, Pat. No. 4,356,302. This application Apr. 30, 1982, Ser. No. 373,329

Int. Cl.³ C07D *279/16*

U.S. Cl. 544—51 **11 Claims**

1. An intermediate compound of the formula



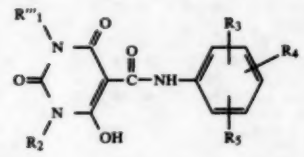
wherein W represents CN, $CONH_2$ or CON=CHNXY, wherein X represents a lower alkyl of 1 to 4 carbon atoms and Y represents a lower alkyl of 1 to 4 carbon atoms; and R'' represents hydrogen, methoxy, trifluoromethyl or lower alkyl having 1 to 4 carbon atoms when R''' represents hydrogen, and when R'' represents halogen, R''' represents hydrogen or halogen.

4,399,280
5-PHENYLCARBAMOYLBARBITURIC ACID COMPOUNDS

Bernardo de Sousa, Basel; Rene Muntwyler, Hofstetten, and Werner Schmid, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 73,048, Sep. 6, 1979, Pat. No. 4,283,444.
This application Dec. 5, 1980, Ser. No. 213,252
Claims priority, application Switzerland, Sep. 12, 1978, 9545/78
Int. Cl.³ C07D *239/62*
U.S. Cl. 544—301 **4 Claims**

1. A 5-phenylcarbamoylbarbituric acid compound of the formula



wherein R_1''' is unsubstituted or substituted phenyl, R_2 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, benzyl or unsubstituted or substituted phenyl, R_3 is halogen, nitro or trihalomethyl, R_4 is hydrogen, halogen or trihalomethyl, and R_5 is hydrogen, halogen, methyl or methoxy, said substituted phenyl moieties being substituted by 1 to 3 substituents selected from the group consisting of C_1–C_4-alkyl or -alkoxy, chlorine, bromine, fluorine, nitro or trihalomethyl but containing at most one nitro group, at most two trihalomethyl groups and at most two alkoxy groups and the tautomeric forms and salts thereof.

4,399,281
2,2'-BIPYRIDINIUM CHLOROCHROMATE OXIDANT

Frank S. Guziec, Jr., Las Cruces, N. Mex., assignor to Thiokol Corporation, Chicago, Ill.

Filed Sep. 22, 1981, Ser. No. 304,456
Int. Cl.³ C07B *3/00*; C07D *401/04, 333/16, 317/54*
U.S. Cl. 546—9 **1 Claim**

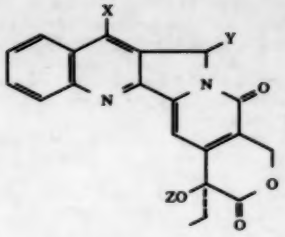
1. 2,2'-bipyridinium chlorochromate.

4,399,282
CAMPTOTHECIN DERIVATIVES

Tadashi Miyasaka, Yokohama; Masahiko Mutai, Higashiyamato; Seigo Sawada, Tokyo; Kenichiro Nokata, Mitaka, and Hisao Hagiwara, Amagasaki, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,953
Claims priority, application Japan, Jul. 10, 1979, 54-86410; Jul. 10, 1979, 54-86411; Jul. 10, 1979, 54-86412; Jul. 10, 1979, 54-86413; May 9, 1980, 55-60736
Int. Cl.³ C07D *491/147*; A61K *31/47*
U.S. Cl. 546—48 **40 Claims**

1. A camptothecin derivative of the formula:



(I)

wherein X is H, CH_2OH, COOH, a straight or branched chain alkyl group with 1–18 carbon atoms, a cycloalkyl group with 5–7 carbon atoms, a phenylalkyl group having 1 to 3 carbon atoms in the alkylene portion thereof, or the group CH_2O-COR^1 or $COOR^2$ where R^1 is a straight or branched chain alkyl group with 1–17 carbon atoms, trifluoromethyl, phenyl, a phenylalkyl group having 1 to 2 carbon atoms in the alkylene portion thereof or the group $HOOC—(CH_2)_n$ where n is an integer of 2 to 4 and where R^2 is a lower alkyl group; Y is H, OH or OR^3, where R^3 is a lower alkyl group, an alkanoyl group with 1–5 carbon atoms, benzoyl or a phenylalkanoyl group with 1–2 carbon atoms in the alkylene portion thereof; and Z is H, acetyl or trifluoroacetyl; with the proviso (1) that when X is CH_2OH, the straight or branched alkyl group, the cycloalkyl group or the phenylalkyl group, both Y and Z are H, (2) that when X is CH_2OCOR^1 or $COOR^2$, Y is H, (3) that when Y is OH, both X and Z are H, and (4) that when Y is OR^3, X is H; or a water-soluble alkali metal salt thereof.

4,399,283
PHARMACEUTICAL SALTS OF 4'-(9-ACRIDINYLAMINO)-METHANESULFON-M-ANISIDIDE

James R. Fisher, Royal Oak, and Charles P. Kulier, Holland, both of Mich., assignors to Warner Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 129,503, Mar. 11, 1980, abandoned. This application Sep. 16, 1981, Ser. No. 302,943
Int. Cl.³ C07D *219/10*; A61K *31/47*
U.S. Cl. 546—106 **1 Claim**

1. The compound having the name 4'-(9-acridinylamino)methanesulfon-m-anisidide β-glycerophosphate.

4,399,284
PROCESS FOR THE OPTICAL RESOLUTION OF MIXTURES OF D- AND L-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACIDS

Vincenzo Cannata, Borgo Nuovo Pontecchio Marconi, and Graziano Zagnoni, Vergato, both of Italy, assignors to Alfa Farmaceutici S.p.A., Bologna, Italy

Filed Jul. 13, 1981, Ser. No. 282,440
Claims priority, application Italy, Jul. 30, 1980, 3492 A/80
Int. Cl.³ C07D *453/04*; C07B *19/00*
U.S. Cl. 546—134 **12 Claims**

1. A process for the resolution into the optically active isomers of mixtures of d- and l-2-(6-methoxy-2-naphthyl)-propionic acids, which consists of:

(a) preparing a solution of a mixture of d- and l-2-(6-methoxy-2-naphthyl)-propionic acids and the optically active organic base cinchonidine in an organic solvent selected from the group consisting of formamide, monomethylformamide, dimethylformamide, monoethylformamide, diethylformamide, monomethylacetamide and diethylacetamide, at a temperature between about 70° and about 90° C. to obtain a solution;

(b) gradually cooling said solution and, at a predetermined temperature, seeding with crystals of a salt of d-2-(6-

methoxy-2-naphthyl)-propionic acid and cinchonidine, said salt having a content by weight of the organic solvent used in step (a) which content is between 9.5% and about 14%, and further gradually cooling, whereby the salt of d-2-(6-methoxy-2-naphthyl)-propionic acid with cinchonidine precipitates, which salt has a content by weight of said organic solvent used in step (a) between about 9.5% and 14% and filtering said salt;

(c) reacting said salt from step (b) with a mineral acid in an organic solvent whereby the free d-2-(6-methoxy-2-naphthyl)-propionic acid is obtained.

9. The cinchonidine salt of d-2-(6-methoxy-2-naphthyl)-propionic acid containing 10.6% by weight of dimethylformamide.

4,399,285
TETRAZOLYLOXYACETIC ACID AMIDES, PIPERIDIDES AND PERHYDRO AZEPINIDES

Heinz Förster; Wolfgang Hofer; Fritz Maurer; Volker Mues, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

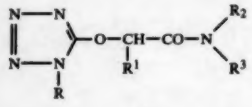
Filed Oct. 24, 1980, Ser. No. 200,171

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946432

Int. Cl.³ C07D *257/02, 401/12, 403/12*

U.S. Cl. 546—210 **10 Claims**

1. A tetrazolyloxycarboxylic acid amide of the formula



(I)

wherein

R is phenyl, mono chlorophenyl or dichlorophenyl,

R^1 is hydrogen,

R^2 is C_1–C_6-alkyl, allyl, propargyl, 1-methyl-propargyl, 1,1-dimethyl-propargyl, cyclohexyl, benzyl or phenyl, and

R^3 is C_1–C_6-alkyl or allyl or

R^2 and R^3 together with the nitrogen atom to which they are bonded, represent piperidyl, monoalkyl or dialkyl substituted piperidyl with 1 to 3 carbon atoms per alkyl group or perhydroazepinyl.

4,399,286
ANTIARRHYTHMIC PHENETHYLPIPERIDINE COMPOUNDS

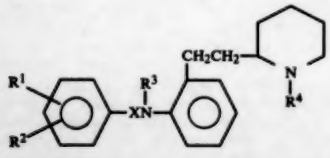
John E. Lawson, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Jul. 16, 1981, Ser. No. 283,710

Int. Cl.³ C07D *211/28*

U.S. Cl. 546—231 **2 Claims**

1. A compound selected from the group consisting of a compound having Formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein

R^1 is hydrogen, halogen, lower (meaning 1 to 4 carbon atoms inclusive) alkyl, lower alkoxy or lower alkylthio;

R^2 is hydrogen, hydroxy or methoxy;

R^3 and R^4 are independently selected from hydrogen or lower alkyl;

X is the divalent group

4,399,287
PHOSPHINIC ACID DERIVATIVES

Alister C. Baillie, Bottisham; Brian J. Wright, Bishops Stortford; Kenneth Wright, Lode, and Christopher G. Earnshaw, Chesterton, all of England, assignors to FBC Limited, Hauxton, England

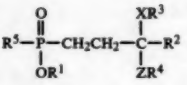
Filed Dec. 5, 1980, Ser. No. 213,602

Claims priority, application United Kingdom, Dec. 8, 1979, 79/42420

Int. Cl.³ C07F *9/30;* **A01N** *57/20, 57/24*

U.S. Cl. 548—119 **7 Claims**

1. A compound of the formula:



wherein

R^5 is methyl or halomethyl;

R^1 is hydrogen, a cation or alkyl;

R^2 is carboxyl or a salt, ester of amide thereof;

X and Z, which may be the same or different, are each —O—, —S— or —NR^7— wherein R^7 is hydrogen or alkyl;

R^3 and R^4, which may be the same or different, are each alkyl or together form an alkylene chain; or one of XR^3 and ZR^4 is —OH and the other is —CN or —$SO_3\ominus$ cation; or XR^3 and ZR^4 together form carbonyl oxygen, or a hydrazone, oxime, semicarbazone or thiosemicarbazone derivative thereof.

4,399,288
SEPARATION OF A 2-OXAZOLINE FROM AN AQUEOUS SOLUTION

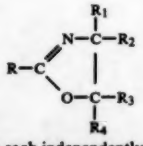
John C. McClure, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 21, 1981, Ser. No. 226,971

Int. Cl.³ C07D *211/34*

U.S. Cl. 548—239 **9 Claims**

1. A process for the separation of a 2-oxazoline, represented by the formula I



I

wherein R_1–R_4 are each independently hydrogen, C_1–C_2 alkyl or C_1–C_2 hydroxyalkyl and R is hydrogen, C_1–C_4 alkyl or C_2–C_4 alkenyl, from an aqueous solution, said process comprising the steps of

(a) contacting an aqueous solution of a 2-oxazoline and an amide adduct of 2-oxazoline with a surface of a polymeric membrane, comprising a homopolymer or copolymer of an olefin, which is selectively permeable to the 2-oxazoline but is less permeable to water and the amide adduct;

(b) permeating the 2-oxazoline through the membrane to a non-communicating permeate zone;

(c) transporting the 2-oxazoline from the permeate zone to a recovery zone; and
(d) recovering the 2-oxazoline essentially free of water in the recovery zone.

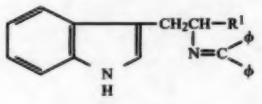
4,399,289

2-DIPHENYLMETHYLENEAMINO-3-INDOLYLPROPIONITRILE AND ALKYL ESTERS OF 2-DIPHENYLMETHYLENE-AMINO-3-INDOLYLPROPIONIC ACID

Shinzo Imamura; Haruyo Sato, and Hiroyoshi Kuramoto, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,938
Claims priority, application Japan, Mar. 31, 1980, 55-40470; Jan. 26, 1981, 56-8998
Int. Cl.³ C07D *209/18, 209/20*
U.S. Cl. 548—507 **2 Claims**

1. A compound of Formula I,



I

in which R^1 is selected from the group consisting of cyano, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl and butoxycarbonyl, and ϕ is phenyl.

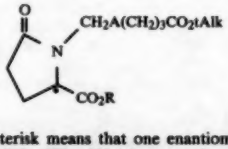
4,399,290

OPTICALLY ACTIVE TERT-ALKYL 7-(2-OXO-5-CARBONYLOXYPYRROLIDINYL)HEPTANOATES

Richard M. Scribner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 189,061, Sep. 22, 1980, Pat. No. 4,321,201. This application Dec. 9, 1981, Ser. No. 328,842
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ C07D *207/28*
U.S. Cl. 548—534 **6 Claims**

1. A compound of the formula



wherein the asterisk means that one enantiomer is predominant; A is CH_2CH_2, CH=CH (cis or trans); or C≡C; tAlk is a tertiary alkyl of 4 to 7 carbons; and R is a protonated optically-active amine selected from the group consisting essentially of (−)brucine, (−)cinchonidine, (+)dehydroabietylamine, (+)α-(1-naphthyl)ethylamine, (−)α-(1-naphthyl)ethylamine, (+)ephedrine, (−)ephedrine, (+)α-methylbenzylamine, (−)α-methylbenzylamine, (+)2-aminobutane, and (−)2-aminobutane.

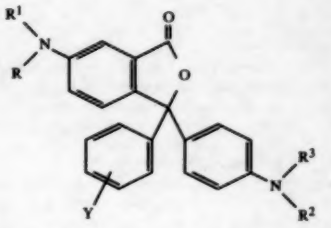
4,399,291

PROCESS FOR THE PRODUCTION OF SUBSTITUTED AMINOPHTHALIDES

Paul J. Schmidt, Sharonville, Ohio, and Patrick J. Jefferies, Fort Mitchell, Ky., assignors to Sterling Drug Inc., New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,918
Int. Cl.³ C07D *307/88*
U.S. Cl. 549—308 **6 Claims**

1. A process for the production of 3-(Y-phenyl)-3-(4-N—R-2—N—R^3-aminophenyl)-6—N—R—N—R^1-aminophthalides which are of the formula



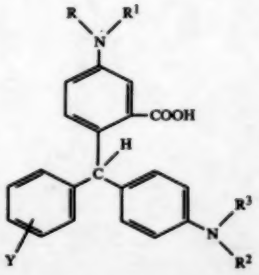
(I)

wherein:

R, R^1, R^2 and R^3 may be identical or different and each represents hydrogen, non-tertiary alkyl of one to four carbon atoms, hydroxyalkyl of two or three carbon atoms, phenyl, benzyl or phenyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms; and

Y represents hydrogen, halo, non-tertiary alkyl of one to four carbon atoms, non-tertiary alkoxy of one to four carbon atoms, or dialkylamino or N-alkylbenzylamino in which alkyl in which alkyl is non-tertiary alkyl of one to four carbon atoms and benzyl may be substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms,

which consists of reacting in approximately equimolecular proportions a Y-benzaldehyde, an N—R^2—N—R^3-aniline and a 3-(N—R—N—R^1)-aminobenzoic acid in which R, R^1, R^2, R^3 and Y have the meanings given for Formula (I), in an acidic medium to produce a 2-[(Y-phenyl)(4—N—R^2—N—R^3-aminophenyl)methyl]-5—N—R—N—R^1-aminobenzoic acid of the formula



(II)

and oxidizing said 2-[(Y-phenyl)(4—N—R^2—N—R^3-aminophenyl)methyl]-5—N—R—N—R^1-aminobenzoic acid of Formula (II) in an aqueous alkaline medium to produce a 3-(Y-phenyl)-3-(4—N—R^2—N—R^3-aminophenyl)-6—N—R—N—R^1-aminophthalide of Formula (I).

4,399,292

PROCESS FOR PURIFYING OXYGEN CONTAINING RECYCLE GAS DERIVING FROM OZONIZATION

Pier P. Rossi, Garlasco; Roberto Jacuone, Cesano Maderno, and Franco Magnoni, Milan, all of Italy, assignors to Snia Viscosa Societa Nazional Industria Applicazioni Viscosa sPa, Milan, Italy

Filed Jun. 28, 1979, Ser. No. 52,911

Claims priority, application Italy, Jun. 30, 1978, 25159 A/78; Sep. 21, 1978, 27929 A/78

Int. Cl.³ C07D *323/02*; B01D *19/00, 47/00, 46/00*; C07C *51/16, 1/20*

U.S. Cl. 549—431 19 Claims

1. A process for separating and recovering organic compounds from oxygen-containing recycle gas deriving from the ozonisation of mono or polyunsaturated compounds, in the presence or absence of solvents, wherein said gas, before being recycled to an ozone generator, is subjected to a treatment in the stage order as indicated comprising:

(a) passage through an apparatus comprising a filter containing glass wool in which peroxide products contained in the gas in the form of fumes are separated by filtering;

(b) countercurrent scrubbing with a polyoxyalkyleneglycol having a molecular weight of 200 to 10,000 and pretreated with an anhydride of a monocarboxylic acid containing 2 to 4 carbon atoms (PAG I); and

(c) countercurrent scrubbing with an excess of a basic compound of an alkali metal in the form of an aqueous solution having a pH≧8;

the organic compounds absorbed during said countercurrent scrubbing in stage (b) being then recovered by stripping at atmospheric pressure or under vacuum.

4,399,293

PROCESS FOR THE PREPARATION OF A FURAN DERIVATIVE

John W. Clitherow, Sawbridgeworth, England, assignor to Glaxo Group Limited, London, England

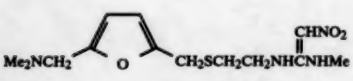
Filed Feb. 19, 1982, Ser. No. 350,414

Claims priority, application United Kingdom, Feb. 20, 1981, 8105454

Int. Cl.³ C07D *307/52*

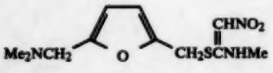
U.S. Cl. 549—494 8 Claims

1. A process for the preparation of ranitidine of formula (I)



(I)

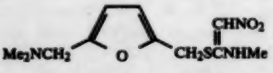
which comprises reacting a compound of formula (II)



(II)

with aziridine.

8. The compound 1-[[5-[(dimethylamino)methyl]-2-furanylmethyl]thio]-N-methyl-2-nitroethenamine of formula (II)



(II)

4,399,294

PROCESS FOR THE PREPARATION OF A FURAN DERIVATIVE

David E. Bays, Ware; John W. Clitherow, Sawbridgeworth, and Duncan B. Judd, Ware, all of England, assignors to Glaxo Group Limited, London, England

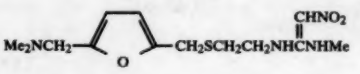
Filed Dec. 30, 1981, Ser. No. 335,686

Claims priority, application United Kingdom, Dec. 30, 1980, 8041493

Int. Cl.³ C07D *307/46*

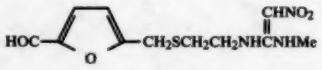
U.S. Cl. 549—495 10 Claims

1. A process for the preparation of ranitidine of formula (I)



(I)

which comprises treating an aldehyde of formula (II)



(II)

with dimethylamine and a reducing agent which is capable of effecting reductive alkylation to introduce the dimethylaminomethyl group but which does not reduce the nitroethene group, the reaction being carried out in a suitable solvent.

4,399,295

PROCESS FOR PREPARING OXIRANE COMPOUNDS

Martin B. Sherwin, London, England, and Marshall E. Frank, Chappaqua, N.Y., assignors to Chem Systems Inc., New York, N.Y.

Continuation-in-part of Ser. No. 919,792, Jun. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 861,803, Dec. 19, 1977, abandoned. This application May 4, 1979, Ser. No. 36,153

Int. Cl.³ C07D *301/02*

U.S. Cl. 549—518 13 Claims

1. In a process for preparing an oxirane compound by the deacyloxylation of a vicinal hydroxyester using as a catalyst a basic material, the improvement which comprises carrying out the process continuously in a dilute phase transport reactor by:

(a) heating a fluidized bed of catalyst in a heating zone to the temperature necessary for carrying out the deacyloxylation process;

(b) introducing said heated catalyst and a preheated feed gas stream into the reactor, wherein the deacyloxylation of a vicinal hydroxyester component of the feed gas is accomplished, thereby producing an oxirane compound;

(c) separating the reacted gas stream from the catalyst;

(d) returning the catalyst to the heating zone for reheating; and

(e) further processing the reacted gas stream to separate out the oxirane product.

4,399,296

HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

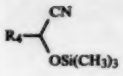
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 222,202, Jan. 2, 1981, Pat. No. 4,367,234, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,742

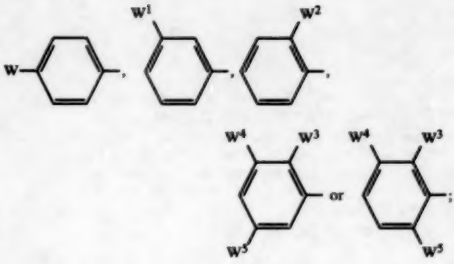
Int. Cl.³ C07F *7/10*

U.S. Cl. 556—416 8 Claims

1. A compound of the formula



wherein
R^4 is



W is hydrogen or fluoro;
W^1 is benzyloxy, chloro, phenoxy, nitro or trifluoromethyl;
W^2 is benzyloxy, phenoxy, nitro or trifluoromethyl;
W^3 is methyl, (C_1-C_2)alkoxy, methylthio, chloro, or fluoro; and
W^4 and W^5 are each independently hydrogen, methyl, bromo, chloro, fluoro, cyano, nitro or trifluoromethyl.

4,399,297

POLYALKOXYCARBINOL CINNAMATES AND PROTECTIVE SUN AGENTS CONTAINING THESE COMPOUNDS

Frank Thoemel; Karl Seib, both of Weinheim; Kurt Schneider, Bad Duerkheim, and Paul Naegele, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

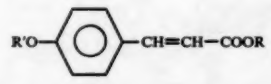
Filed Jul. 2, 1981, Ser. No. 279,795

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028503

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—55 **2 Claims**

1. A compound of the formula I:



wherein R is a polyethylene glycol radical or a polypropylene glycol radical, each of said radicals having 5 to 25 chain members, and R' is a straight chain or branched alkyl of 1 to 4 carbon atoms.

4,399,298

CARBOXYLIC ACID ESTER DERIVATIVES OF 4-FLUOROPHENOL

Shigeru Sugimori; Yukio Honda, and Tetsuhiko Kojima, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

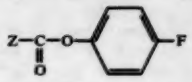
Filed Feb. 12, 1981, Ser. No. 233,776

Claims priority, application Japan, Feb. 15, 1980, 55-17247; Feb. 22, 1980, 55-21298

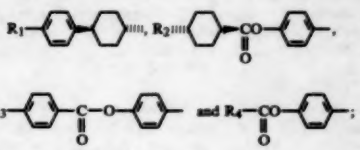
Int. Cl.³ C07C *69/76*

U.S. Cl. 560—59 **6 Claims**

1. Ester derivatives of p-fluorophenol expressed by the general formula


(I)

wherein Z represents a group selected from the group consisting of



R_1 represents an alkyl group or an alkoxy group, each having 1 to 10 carbon atoms; R_2 represents H or an alkyl group having 1 to 10 carbon atoms; R_3 represents an alkyl group or an alkoxy group, each having 1 to 10 carbon atoms and R_4 represents an alkyl group having 1 to 10 carbon atoms.

4,399,299

BIS(SUBSTITUTED PHENOXYACETATES) OF N-ALKYL-DIALCANOLAMINES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Jean-Jacques Godfroid, and Jean Thuillier, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris, France

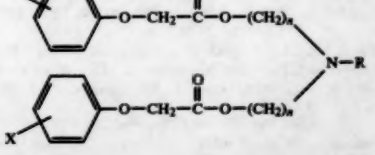
Filed Apr. 21, 1981, Ser. No. 256,167

Claims priority, application France, Apr. 3, 1980, 80 09886

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—63 **16 Claims**

1. A compound selected from the group consisting of N-alkyl-dialkanolamine-bis-(substituted phenoxyacetate) of the formula



wherein X is selected from the group consisting of chlorine, fluorine and —CF_3, n is an integer from 1 to 3, R is lower alkyl and their non-toxic, pharmaceutically acceptable acid addition salts.

4,399,300

METHOD OF PREPARING MALONIC ACID DIALKYL ESTERS

Uwe Prange, Niederkassel-Ranzel; Moustafa El Chahawi, Troisdorf; Wilhelm Vogt, Cologne, and Hermann Richtzenhain, Much-Schwellenbach, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 169,009, Jul. 15, 1980, abandoned, which is a continuation of Ser. No. 879,993, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 687,841, May 19, 1976, abandoned. This application May 4, 1981, Ser. No. 260,444

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1975, 2524389; Jan. 28, 1976, 2603026

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 12 Claims

1. Process for producing malonic acid dialkyl ester which consists essentially of contacting the corresponding halogen acetic acid alkyl ester wherein said halogen is chlorine, bromine or iodine with carbon monoxide, an alkylol of 1–8 carbon atoms, and alkali alcoholate, alkali earth alcoholate or a solution of alkali hydroxide in said alkylol, said alcoholate moiety corresponding to said alkylol, at a pH of up to 8.5 in the presence of $Co_2(CO)_8$ as catalyst for the reaction, at a temperature of 0° C. to 150° C. and a carbon monoxide pressure of 0.1–50 atmospheres absolute.

4,399,301

METHYLENICALLY-SUBSTITUTED UNDECADIENES

Didier Morel, Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

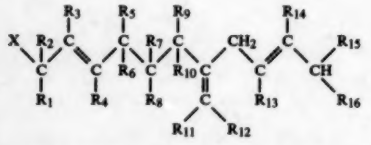
Filed Sep. 13, 1979, Ser. No. 75,216

Claims priority, application France, Sep. 15, 1978, 78 26509

Int. Cl.³ C07C *33/02, 43/15, 43/215, 69/007, 69/145, 69/24*

U.S. Cl. 560—261 10 Claims

1. A methylenically-substituted undecadiene compound having the structural formula:



wherein X is selected from the group consisting of lower acyloxy, aryloxy having from 6 to 14 carbon atoms, lower alkoxy and hydroxy, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15} and R_{16} are independently selected from the group consisting of hydrogen and lower alkyl, with the proviso that at least one of R_3, R_5 and R_6 and at least one of R_9, R_{10}, R_{11} and R_{12} must be hydrogen.

4,399,302

4-METHYLMERCAPTO-2-ACETOXY-BUTYRALDEHYDE

Kloesmann, Axel, Hanau, Fed. Rep. of Germany; Rudolf Fahnenstich, Wykoff, N.J., and Marc Samson, Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

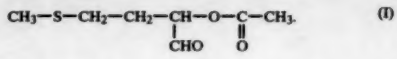
Filed Feb. 25, 1982, Ser. No. 352,451

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3107007

Int. Cl.³ C07C *149/14*

U.S. Cl. 560—266 1 Claim

1. 4-methylmercapto-2-acetoxy-butyraldehyde of the formula



(I)

4,399,303

PREPARATION AND USE OF NITROTEREPHTHALAMIC ACIDS

George N. Milford, Jr., Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1981, Ser. No. 293,329

Int. Cl.³ C07C *79/46*

U.S. Cl. 562—437 1 Claim

1. 3-nitroterephthalamic acid.

4,399,304

L-PHENYLALANINE ½ SULFATE AND ITS USE

Tsutomu Matsuishi; Hiromasa Maruyama, both of Saga; Toshio Kitahara, Yokosuka; Akemi Kabashima, and Ryuta Toyomasu, both of Saga, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Division of Ser. No. 210,349, Nov. 25, 1980, abandoned. This application Aug. 11, 1981, Ser. No. 291,914

Claims priority, application Japan, Dec. 5, 1979, 54-157562

Int. Cl.³ C07C *101/08*

U.S. Cl. 562—445 6 Claims

1. A process for recovering L-phenylalanine from a fermentation broth containing L-phenylalanine, which comprises adjusting the molar ratio of sulfate ion to L-phenylalanine to greater than 0.5, forming L-phenylalanine ½ sulfate in solution and recovering L-phenylalanine crystals from said fermentation broth or from a solution thereof produced during said recovery process.

4,399,305

PRODUCTION OF ETHYLENE BY THE PYROLYSIS OF ETHYL ACETATE

David J. Schreck, Cross Lanes, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 18, 1982, Ser. No. 435,095

Int. Cl.³ C07C *53/08, 1/00*

U.S. Cl. 562—607 4 Claims

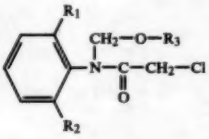
1. Process for making ethylene in high purity which comprises contacting ethyl acetate at a temperature of 150° C. to about 250° C. with a catalytic amount of a perfluorosulfonic acid resin catalyst, which is a copolymer of tetrafluoroethylene and a sulfonyl fluoride vinyl ether, at a contact time of at least about 1 second and continuously removing ethylene and acetic acid.

4,399,306
PROCESS FOR THE PREPARATION OF 2,6-DIALKYL-N-ALKOXYMETHYL-2-CHLORO-ACETANILIDES

Kornelia Domjan nee Pinter, Füzfogyartelep; György Huszak, Balatonfüzfo; Zoltan Kolonics, Balatonalmadi; Laszlo Lendvai; Jeno Pelyva, both of Füzfogyartelep; Endre Sümegi, Füzfogyartelep; Elemer Tömördi, Fertoszentmiklos; Bela Gyorfi; Laszlo J. Szabo, both of Martonvasar; Andras Hass, Gyulafiratot; Miklos Kovacs, Veszprem; Laszlo Kulcsar, Veszprem; Miklos Nadasy, Veszprem; Balint Nagy, Veszprem; Andras Vass, Veszprem, and Ervin Vertesi, Veszprem, all of Hungary, assignors to Nitrokemia Ipartelepek, Fuzfogyartelep; Nehezvegyipari Kutato Intezet, Veszprem and Mta Mezogazdasagi Kutato Intezet, Martonvasar, all of, Hungary

Filed Dec. 18, 1979, Ser. No. 104,918
Claims priority, application Hungary, Apr. 24, 1979, NI225
Int. Cl.³ C07C *103/375*
U.S. Cl. 564—214 **9 Claims**

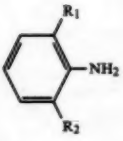
1. In a process for the preparation of a 2',6'-dialkyl-N-alkoxymethyl-2-chloro-acetanilide compound of the general formula (I),



(I)

wherein

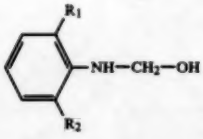
R_1, R_2 and R_3 are identical or different and stand for straight-chained or branched C_{1-4} alkyl groups, by converting a dialkyl aniline into a Schiff base, and reacting the resulting Schiff base with a haloacyl halide and an alkanol, and in which a dialkyl aniline of the general formula (II),



(II)

wherein

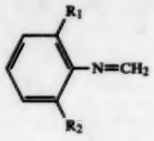
R_1 and R_2 are as defined above, is treated with aqueous formaldehyde solution in an apolar solvent at a temperature of 30° to 80° C.; the improvement in which the solution of the resulting oxymethyl derivative of the general formula (IIIA),



(IIIA)

wherein

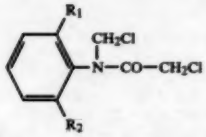
R_1 and R_2 are as defined above, formed with said apolar solvent is separated from the aqueous formaldehyde solution at an elevated temperature and then the separated apolar solvent containing the oxymethyl derivative of the general formula (IIIA) is dehydrated by azeotropic distillation at a temperature above 90° C. to remove the last traces of water, the azomethine derivative of the general formula (III),



(III)

wherein

R_1 and R_2 are as defined above, obtained in the dehydration step is reacted with chloroacetyl chloride in the same apolar solvent medium, the resulting chloromethyl derivative of the general formula (IV),



(IV)

wherein

R_1 and R_2 are as defined above, is reacted with an alcohol of the general formula (V),

$$R_3\text{-OH} \qquad \text{(V)}$$

wherein

R_3 is as defined above, in an amount sufficient to bind the hydrochloric acid liberated in the reaction, the reaction mixture is admixed with water, and the organic phase containing the required end-product is separated.

4,399,307
AMINATION PROCESS

Tod K. Shioyama, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1982, Ser. No. 357,121
Int. Cl.³ C07C *87/40, 87/50*
U.S. Cl. 564—437 **7 Claims**

1. A process of recovering at least one high purity amine-substituted cyclic compound selected from the group consisting of bis(4-aminophenyl) methane, 2,2'-bis(3-aminophenyl) ethane, bis(4-aminocyclohexyl) methane, and 2,2'-bis(4-aminocyclohexyl) propane from a material containing such a compound in the presence of one or more monoamine homologs in quantities of about 5 percent or greater comprising

(a) mixing at least one high boiling solvent with the material, and

(b) distilling the mixture under suitable conditions to recover the amine-substituted compound.

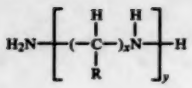
4,399,308
LEWIS ACID HALIDE CATALYSTS FOR PREPARATION OF POLYAMINES

Michael E. Ford, Trexlertown, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

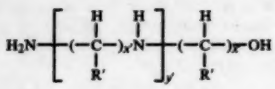
Filed Apr. 28, 1981, Ser. No. 258,251
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 **10 Claims**

1. A process for preparing a noncyclic polyalkylene polyamine which comprises:

contacting an alkyleneamine compound having two primary amino groups of the general formula:



wherein R is hydrogen or a lower alkyl (C_1–C_4) radical, x is a number from 2 to about 6, and y is a number from 1 to about 4 with an alkanolamine compound having a primary or secondary hydroxyl group of the general formula:



wherein R′ is hydrogen or a lower alkyl (C_1–C_4) radical, x′ is a number from 2 to about 6; and y′ is a number from 0 to about 3;

the contacting being performed in the presence of an effective amount of a Lewis acid halide substance which is tin (IV) chloride, zinc chloride or zinc fluoride at a temperature sufficient to effect reaction between the alkyleneamine and the alkanolamine compounds under a pressure sufficient to maintain the reaction mixture essentially in liquid phase.

4,399,309

PREPARATION OF 1-ARYLOXY-METHYL KETONES

Manfred Jautelat, Burscheid; Jörg Stetter, Wuppertal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

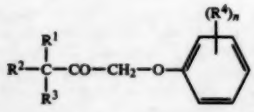
Filed Dec. 30, 1981, Ser. No. 335,942

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101143

Int. Cl.³ C07C *45/51*

U.S. Cl. 568—322 **10 Claims**

1. A process for the preparation of a 1-aryloxy-methyl ketone of the formula



in which

R^1 and R^2 each independently is alkyl, alkenyl or alkynyl with up to 4 carbon atoms, or phenyl, the alkyl and phenyl groups optionally being substituted by halogen, nitro, phenyl, halogenophenyl, alkoxy with up to 3 carbon atoms, phenoxy or halogenophenoxy, or

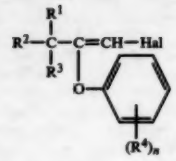
R^1 and R^2 together form an alkylene chain with 2 to 7 carbon atoms,

R^3 is alkyl with up to 10 carbon atoms or aryl with 6 to 10 carbon atoms, the alkyl or aryl radicals optionally being substituted by halogen, nitro, phenyl, halogenophenyl, alkoxy with up to 3 carbon atoms, phenoxy or halogenophenoxy,

R^4 each independently is halogen, alkyl, alkoxy, nitro, alkyl or alkoxy with up to 3 carbon atoms, phenyl or halogenophenyl, and

n is 0, 1, 2 or 3,

comprising contacting a 1-halogeno-2-aryloxy-1-alkene of the formula



in which Hal is chlorine or bromine,

with acid at a temperature from about 20° to 150° C., until about 95 to 100% of the alkene reacts, adding a base, and then allowing the reaction to go to completion under weakly alkaline conditions by continuing contact of the reactants at about 20° to 150° C.

4,399,310

PREPARATION OF 1,3-CYCLIC DIONES BY VAPOR PHASE CYCLIZATION OF DELTA-KETO CARBOXYLIC ACID ESTERS UTILIZING CARRIER CONDENSABLE UNDER AMBIENT CONDITIONS

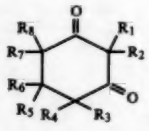
Nicholas P. Greco, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 18, 1981, Ser. No. 303,541

Int. Cl.³ C07C *45/45*

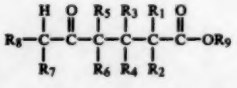
U.S. Cl. 568—346 **17 Claims**

1. A process for making a cyclic dione of the general formula



wherein R_1–R_8 are selected from hydrogen and alkyl groups of up to about 6 carbon atoms, with the proviso that the total number of carbon atoms of R_1–R_8 cannot exceed 24, said process comprising:

passing a gas stream through a reaction zone containing a carbon catalyst suitable for cyclization of a delta-keto ester to form a cyclic dione, said gas stream comprising a delta-keto ester and a condensable non-reactive carrier, said delta-keto ester having the general formula



wherein R_1–R_8 are defined as before and R_9 is selected from an alkyl, aryl and alkylaryl groups, with the proviso that the total number of carbon atoms of R_9 cannot exceed 24,

said non-reactive carrier selected from a lactone, an organic acid, an organic anhydride, an ester, and an aromatic hydrocarbon; with the further proviso that substantially all of said carrier has a sufficiently high boiling point so that said carrier is a liquid at 25° C. and under one atmosphere pressure, whereby the gas stream may be easily condensed and cyclic dione product subsequently separated from the carrier and from unreacted delta-keto ester.

4,399,311

PROCESS FOR PRODUCING AROMATIC ALDEHYDES

Shigeo Yoshinaka; Tsukasa Toki; Misuzu Wakatsuki, and Seiji Uchiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,733
Claims priority, application Japan, Jul. 16, 1980, 55-97151
Int. Cl.³ C07C *45/42, 45/43*
U.S. Cl. 568—437 3 Claims

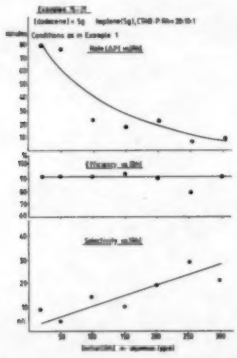
1. In a process for producing aromatic aldehydes by reacting chlorinated methylbenzenes with nitric acid, the improvement wherein a lead compound selected from the group consisting of lead nitrate, lead carbonate or lead hydroxide is added to the residue left after separation and recovery of the resulting aromatic aldehydes from the reaction mixture, thereby to remove a chlorine ion present in the residue as a precipitate of lead chloride, and the residue left after removal of the lead chloride is recycled to the reaction of the chlorinated methylbenzenes with nitric acid.

4,399,312

CATALYTIC PROCESS

Michael J. H. Russell, Reading, and Barry A. Murrer, Henley-on-Thames, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Aug. 27, 1981, Ser. No. 297,083
Claims priority, application United Kingdom, Sep. 4, 1980, 8028521
Int. Cl.³ C07C *45/50*
U.S. Cl. 568—454 17 Claims



1. A catalytic process for the hydroformylation of olefins having from 3 to 20 carbon atoms to produce a high n:iso ratio of aldehyde product comprising reacting together at elevated temperature and pressure the olefin, hydrogen and carbon monoxide in the presence of a catalyst comprising a water-soluble complex of a platinum group metal in a reaction medium comprising an aqueous phase and an organic phase and in the further presence of an amphiphilic reagent, the aqueous phase containing the catalyst, the organic phase containing the olefin, the amphiphilic reagent permitting the olefin to cross from the organic phase into the aqueous phase and enabling the resulting product aldehyde to cross into the organic phase, said amphiphilic reagent being substantially soluble in the aqueous phase and substantially insoluble in the organic phase, the reaction temperature being in the range 40°–150° C. and the reaction pressure being in the range 300–10000 kPa, the ratio of aqueous phase to organic phase being in the range of 0.33:1 to 5:1 and the concentration of amphiphilic reagent to precious metal being up to 100:1 on a molar basis.

4,399,313

POLYOXYETHYLENEATED NON-IONIC SURFACE-ACTIVE AGENTS WITH TWO LIPOPHILIC CHAINS

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Oct. 14, 1980, Ser. No. 196,276
Claims priority, application France, Oct. 16, 1979, 79 25641
Int. Cl.³ C07C *43/13*
U.S. Cl. 568—622 13 Claims

1. A polyoxyethylenated non-ionic surfactant compound having the formula

$$R—X\left[-C_2H_3(OCH_2CH_2)_n(OH)\right]-CH_2—Y—R'$$

wherein

X represents oxygen,

y represents methylene,

R and R' each independently represent alkyl having 6 to 20 carbon atoms, alkenyl having 6 to 20 carbon atoms, the sum of the number of carbon atoms in R and R' being 22 to 30, and

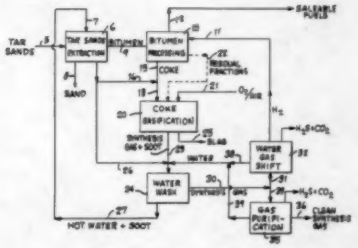
n is a number ranging from 1 to 40.

4,399,314

PROCESS FOR THE PRODUCTION OF FUELS FROM TAR SANDS

Edward T. Child, Tarrytown, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,333
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—11 LE 10 Claims



1. A process for the production of liquid and gaseous fuels from tar sands which comprises:

(a) contacting tar sand with hot water containing carbon and mineral contaminants from said tar sand in a tar sands extraction step effecting separation of bitumens and carbon from sand and water containing mineral contaminants from said tar sand;

(b) subjecting said separated bitumen and carbon to hydrocracking with hydrogen under hydrocracking reaction conditions effecting conversion of said bitumen to lower molecular weight hydrocarbons and carbonaceous residue comprising said carbon;

(c) recovering lower molecular weight hydrocarbon products of said hydrocracking reaction;

(d) separating sand from said water containing mineral contaminants;

(e) withdrawing carbonaceous residue comprising said carbon combined with coke or tar from said hydrocracking reaction process and passing said residue together with water containing mineral contaminants from said extraction step to a gasification reaction zone;

(f) reacting said residue and said contaminants with oxygen and steam from said water in said gasification reaction zone at an autogenously maintained temperature in the range of 1800°

to 3500° F. with the production of a minor amount of ungasified carbon and slag containing mineral components from said water and producing a hot gas stream comprising carbon monoxide, hydrogen, steam, and entrained carbon;

(g) separating slag from the reaction products of (f);

(h) contacting said hot gas stream from said gasification reaction zone with contaminated water from said extraction step in a water washing zone vaporizing part of the water to steam and effecting removal of carbon from said gas stream and forming a dispersion of carbon in hot contaminated water;

(i) passing said dispersion of carbon and hot contaminated water to said tar sands extraction zone wherein carbon is transferred to said bitumen, and

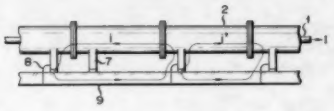
(j) discharging synthesis gas comprising carbon monoxide, hydrogen and steam substantially free from solid carbon particles from said water wash step as a product of the process.

4,399,315

GAS-INSULATED ELECTRIC APPARATUS

Tatsuo Iida, Ebina, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 5, 1981, Ser. No. 290,323
Claims priority, application Japan, Aug. 12, 1980, 55-110901
Int. Cl.³ H02G 15/24
U.S. Cl. 174—21 C 4 Claims



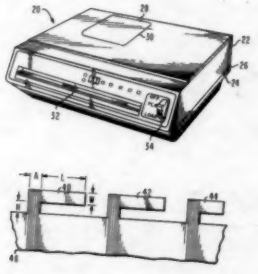
1. A gas-insulated electric apparatus which comprises a plurality of linearly arranged grounded metal cases; and wherein a flange is formed at both ends of all adjacent metal cases; the flanges provided at the mutually facing ends of said metal cases are tightly joined together by proper means for the electric and mechanical connection of said metal cases; and a compound prepared by mixing silicone oil with 20 to 40% by weight of zinc powder (based on the whole weight of the compound) and 5 to 15% by weight of aluminum powder (based on the whole weight of the compound) is applied to the surface of the junction of the flanges.

4,399,316

NON-CONTACTING RF SHIELDING DEVICE

Oakley M. Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,181
Int. Cl.³ H05K 9/00
U.S. Cl. 174—35 GC 6 Claims



1. In combination:

a first conductive surface for providing electrical shielding;

a second conductive surface for providing electrical shielding, said second surface having at least a portion thereof continguous with at least a portion of said first conductive surface but not in direct electrical contact therewith, thereby creating an interface area, said interface area allowing the flow of energy therethrough in a given frequency band whereby said shielding is rendered less effective;

a plurality of elongated conductive stub-like members positioned in said interface area, a first end of each of said stub-like members being directly connected to a common conductive member and each of said stub-like members being spaced at a given distance from at least a portion of said first conductive surface such that said stub-like members and said first conductive surface form a plurality of microstrip lines open-circuited at the second end of each stub-like member remote from said first end;

each of said stub-like members being dimensioned such that said open circuits at said second ends are transformed into low impedance paths in said given frequency band, said paths effectively occurring between said portion of said first conductive surface and respective points in the vicinity of said first ends of said stub-like members without direct conductive contact between said first conductive surface and said respective points in the vicinity of said first ends of said stub-like members; and

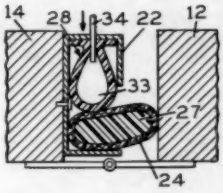
means adapted for coupling said common conductive member to said second conductive surface.

4,399,317

SEALING APPARATUS FOR RADIO FREQUENCY SHIELDING ENCLOSURE

Garritt C. Van Dyk, Jr., Bethel, Conn., assignor to Keene Corporation, Norwalk, Conn.

Filed Sep. 18, 1981, Ser. No. 303,390
Int. Cl.³ H05K 9/00
U.S. Cl. 174—35 GC 11 Claims



1. An apparatus for providing an electrically conductive seal between a first conductive section and a second conductive section of a shielding enclosure comprising:

(a) a conductive housing of rectangular cross section aligned and secured in close proximity to or upon the periphery of the first of said sections;

(b) a conductive elastomeric tube of generally circular cross section with a diameter approximately equal to the length of a shorter side of said rectangular cross section disposed within said housing along the length of said housing;

(c) a highly resilient elastomeric core disposed within said tube;

(d) a longer side of said rectangular housing in facing relationship to a surface of said second conductive section having a slot aligned with said conductive elastomeric tube of a width approximately equal to but smaller than a diameter of said tube;

(e) an inflatable elastomeric seal disposed in said housing parallel to said conductive elastomeric tube; and

(f) means through which said seal is inflated and deflated whereby said conductive elastomeric tube is contacted by said seal and a portion of said tube is forced through said slot into contact with said second enclosure section when compressed by expansion of said inflatable seal and returns to a position substantially within said housing when said inflatable seal is deflated.

4,399,318

EMI SHIELDING ENCLOSURE FOR A CABLE CONNECTOR

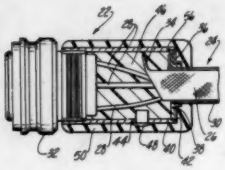
Edwin R. Waters, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1981, Ser. No. 329,153
Int. Cl.³ H01R 13/658
U.S. Cl. 174—35 C 4 Claims

1. An EMI shielded connector assembly comprising a cable connector body, a cable having at least a first cover overlying jacketed wires, a second braided cover overlying the first cover, the cable having the jacketed wires therein extending beyond the first and second covers and inserted in the connector body, each of the first and second covers terminating in respective tails; and an aliminum back-shell receiving the cable

at one end and press fit to the connector body at the other end, the back-shell having an aperture therein adapted to receive potting compound within the shell; said assembly characterized by:

first means encircling the cable and having a slot means therein receiving and securing the tail of the second braided cover;



second means securing said first means to the back-shell;

potting compound filling the interior of the back-shell and securing the tail of the first cover and the jackets of the wires therein; and

means comprised of aluminum closing the aperture and with the back-shell and said first means forming an EMI shield over the cable and connector body.

4,399,319

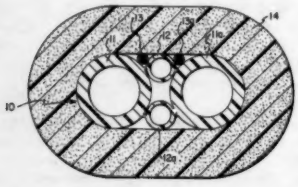
THERMALLY INSULATED COMPOSITE FLEXIBLE HOSE

Michael F. Zinn, Ellenville, N.Y., assignor to Bio-Energy Systems, Inc., Ellenville, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,669

Int. Cl.³ F16L *11/04, 11/12*

U.S. Cl. 174—47 **12 Claims**



1. Thermally insulated composite flexible hose comprising

(a) an extended unitary extrusion of elastomeric material comprising

i. at least two spaced primary tubes, and

ii. an intermediate section separably attached to the primary tubes along tear lines and holding said tubes in spaced relation; and

(b) a jacket of foamed thermal insulation surrounding said unitary extrusion.

4,399,320

CONDUCTOR INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 280,917, Jul. 6, 1981, Pat. No. 4,376,725. This application Jul. 9, 1982, Ser. No. 396,662

Claims priority, application United Kingdom, Oct. 17, 1980, 8033564

Int. Cl.³ H05K *1/09*

U.S. Cl. 174—68.5 **5 Claims**

1. A circuit board having on a portion of the surface thereof a coating of a conductor ink comprising:

(a) from about 70 to about 90 percent by weight of copper powder;

(b) from about 1 to about 15 percent by weight of a barium calcium borosilicate glass frit;

(c) from about 0.5 to about 3 percent by weight of bismuth oxide, wherein bismuth oxide is present in admixture with the copper powder or as a component of the glass frit; and

(d) from about 6 to about 25 percent by weight of a suitable organic vehicle.

4,399,321

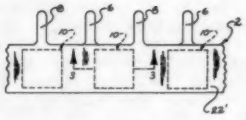
HIGH CAPACITANCE BUS BAR INCLUDING MULTILAYER CERAMIC CAPACITORS

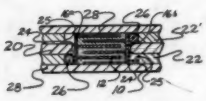
Michael M. Gottlieb, Kraainem, Belgium, assignor to Rogers Corporation, Rogers, Conn.

Filed Mar. 31, 1981, Ser. No. 249,641

Int. Cl.³ H01B *7/00*

U.S. Cl. 174—72 B **6 Claims**





1. A bus bar assembly comprising:

insulating means, said insulating means being comprised of a flat elongated strip of non-conductive material having oppositely disposed first and second faces, said insulating means being provided with at least a first aperture extending therethrough between said faces;

a first bus bar conductor, said first bus bar conductor being bonded to said first face of said insulating means, said first bus bar conductor being provided with at least a first aperture which extends therethrough, said first bus bar aperture being in registration with said first aperture of said insulating means;

a second bus bar conductor, said second bus bar conductor being bonded to said second face of said insulating means, said second bus bar conductor being provided with at least a first aperture which extends therethrough, said second bus bar aperture being in registration with said first aperture of said insulating means;

said registered apertures of said first and second bus bar conductors having a larger cross-sectional area than the aperture in said insulating means;

at least first multilayer capacitor means, said multilayer capacitor means being comprised of a dielectric material having a high dielectric constant, said capacitor means having a plurality of spaced end layers of conductive material on a first pair of oppositely disposed faces of said capacitor means, said capacitor means being positioned within said registered apertures of said insulating means and said first and second bus bar conductors with said end layers of conductive material being oriented substantially transverse to said insulating means first and second faces;

first means electrically connecting one of the conductive end

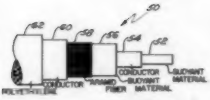
layers of said capacitor means to said first bus bar conductor; and

second means electrically connecting the other of the conductive end layers of said capacitor means to said second bus bar conductor.

4,399,322
LOW LOSS BUOYANT COAXIAL CABLE

Kurt F. Hafner, Jr., Mystic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1982, Ser. No. 344,417
Int. Cl.³ H01B 7/12, 11/06
U.S. Cl. 174—101.5 **8 Claims**



1. A low loss buoyant cable comprising:

a strength material center;

an inner jacket covering said strength material center;

a coaxial cable inner conductor covering said inner jacket;

a low density buoyant material covering said inner conductor;

a coaxial cable outer conductor covering said low density buoyant material;

an outer jacket covering said outer conductor; and

said low loss buoyant cable having amounts of the preceding components in such proportion as to be buoyant in water and all of said components are concentric.

5. A low loss buoyant cable comprising:

a center of buoyant material;

a coaxial cable inner conductor covering said center of buoyant material;

a covering of buoyant material over said coaxial cable inner conductor;

strength material covering said covering of buoyant material;

a coaxial cable outer conductor covering said strength material;

an outer jacket covering said coaxial cable outer conductor; and

said low loss buoyant cable having amounts of the preceding components in such proportions so as to be buoyant in water and all of said components are concentric.

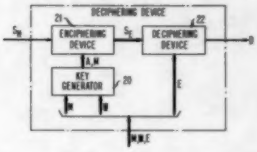
4,399,323
FAST REAL-TIME PUBLIC KEY CRYPTOGRAPHY

Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1981, Ser. No. 233,034
Int. Cl.³ H04K 1/02; G09C 1/06
U.S. Cl. 178—22.14 **8 Claims**

1. A public key cryptographic system (FIG. 1) for communicating securely over an insecure communication channel (3), the system being of the type including a public enciphering knapsack key (H), a private deciphering key (E), first and second integers (M, W) related to each other and to the private deciphering key according to prescribed criteria wherein the first integer is a modulus M and the second integer is a multiplier W, first enciphering means (1) for transforming a data message (D) with the public enciphering knapsack key into a first enciphered message (S_H), means (2) for transmitting the first enciphered message, and receiver means (4-7) for transforming the first enciphered message into the data message (D), the system characterized in that

the receiver means includes means (20) responsive to the first and second integers for generating a private enciphering key (A), the private enciphering key is a k-dimensional vector of individual private enciphering key elements (a_1,-,a_k) represented as natural numbers, second enciphering means (21) for transforming the first enciphered message (S_H) using the private enciphering key into a second enci-



phered message (S_E), deciphering means (22) for transforming the second enciphered message using the private deciphering key into the data message (D), and the private enciphering key generating means includes an inverter means (30) responsive to the second integer for generating a multiplicative inverse W^{-1} therefor, and means (32, 33) responsive to the multiplicative inverse and to the modulus M for generating each individual private enciphering key element according to a prescribed criterion, so that

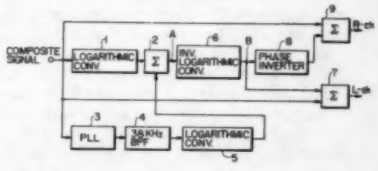
$$a_i = 2^{i-1}W^{-1} \text{(modulo M)},$$

for i=1,2, . . . , k.

4,399,324
MULTIPLEX DEMODULATION CIRCUIT

Kohji Ishida, and Tatsuo Numata, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 3, 1980, Ser. No. 183,783
Claims priority, application Japan, Sep. 7, 1979, 54-114933
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GD **7 Claims**



1. A multiplex demodulation circuit comprising:

first logarithmic conversion means for subjecting an FM detection signal to logarithmic conversion;

second logarithmic conversion means for subjecting to logarithmic conversion a subcarrier signal produced in response to a pilot signal component in said FM detection signal;

addition means for adding an output of said first logarithmic conversion means to an output of said second logarithmic conversion means;

inverse logarithmic conversion means for subjecting an output of said addition means to inverse logarithmic conversion; and

means for separately adding normal-phase and inverted-phase outputs of said inverse logarithmic conversion

means to said FM detection output to separate and provide right and left channels signals.

4,399,325

DEMODULATING CIRCUIT FOR CONTROLLING STEREO SEPARATION

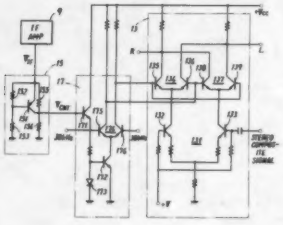
Kanji Tanaka, Gunma, and Noboru Usui, Oota, both of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Dec. 2, 1980, Ser. No. 212,206

Claims priority, application Japan, Dec. 28, 1979, 54-172100

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GM **19 Claims**



1. A stereo demodulating circuit in an FM stereo receiver, comprising:

level signal generating means for generating a level signal representative of electric field strength of a signal being received,

control signal generating means responsive to said level signal for generating a control signal the magnitude of which abruptly changes to a first predetermined value when said electric field strength equals a second predetermined value and smoothly changes as said electric field strength decreases from said second predetermined value,

decoder means responsive to said received signal and a signal derived from a pilot signal included in said received signal for demodulating said signal to provide a plurality of output signals, and

separation control means responsive to said control signal and coupled to said decoder means for controlling the separation of said stereo output signals provided therefrom, whereby said signal separation is abruptly changed from the stereo state to a given state between a stereo state and a monaural state in accordance with said electric field strength and a continuous signal separation change is provided between said given state and said monaural state in accordance with said electric field strength.

4,399,326

AUDIO SIGNAL PROCESSING SYSTEM

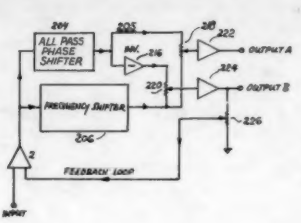
Harald E. W. Bode, 1344 Abington Pl., North Tonawanda, N.Y. 14120

Filed Jan. 12, 1981, Ser. No. 223,951

Int. Cl.³ H03H *7/19*

U.S. Cl. 179—1 D **20 Claims**

1. An audio signal processing system for producing a moving comb filter effect upon an input audio signal, said system comprising frequency shifter means for shifting audio signals in frequency, such frequency shifts being over a range including frequencies equal and less than one Hz, all pass phase shifter means, at least one summing circuit means for providing at least one output signal, first and second parallel branches for applying said input signal to said summing circuit means, said first branch including said frequency shifter means, said all pass



shifter means being connected in one of said first and second branches.

4,399,327

VARIABLE DIRECTIONAL MICROPHONE SYSTEM

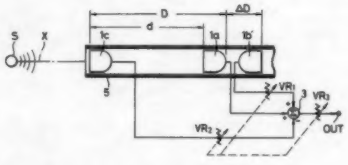
Makoto Yamamoto; Naotaka Miyaji; Yukinobu Ishigaki, and Kaoru Totsuka, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 23, 1981, Ser. No. 227,924

Claims priority, application Japan, Jan. 25, 1980, 55-7568; Feb. 19, 1980, 55-19601

Int. Cl.³ G03B *31/00*

U.S. Cl. 179—1 DM **18 Claims**



1. A variable directional microphone system comprising:

(a) a casing having front and rear portions, said casing being arranged to allow sound waves from all directions to pass therethrough;

(b) a first first order sound pressure gradient unidirectional type microphone unit having a front and a rear, said first microphone unit disposed in said casing in such a direction that the front of said first microphone unit is oriented toward said front portion of said casing;

(c) a second first order sound pressure gradient unidirectional type microphone unit having a front and a rear, said second microphone unit disposed in said casing in such a direction that the front of said second microphone unit is oriented toward said rear portion of said casing, said second microphone unit being arranged in such a manner that the rear of said second microphone unit faces the rear of said first microphone unit, said first and second microphone units respectively having first and second center axes which respectively pass through centers of the fronts and rears of said first and second microphone units, said first and second axes being aligned on a common axis; and

(d) means for combining the output signals of said first and second microphone units at a variable ratio.

4,399,328

DIRECTION AND FREQUENCY INDEPENDENT COLUMN OF ELECTRO-ACOUSTIC TRANSDUCERS

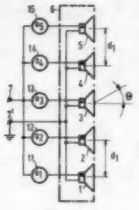
Nico V. Franssen, deceased, late of Knegsel, Netherlands, by Friedrich J. de Haan, administrator, Dommelen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,303

Claims priority, application Netherlands, Feb. 25, 1980, 8001119

Int. Cl.³ H04R *1/40, 5/02, 5/027*

U.S. Cl. 179—1 GA **20 Claims**



1. An electro-acoustic transducer comprising $(2K+1)$ transducer units with substantially identical directivity patterns (k being an integer wherein $2 \leqq k \leqq 4$), said transducer units being situated in line at equal distances (d_1) from each other and being connected to a common electrical transmission channel, each transducer unit including a transducer and an amplitude control device for adjusting the conversion factor of the associated transducer unit, transducer units which are disposed symmetrically relative to a central transducer unit having conversion factors of equal value, the phase shifts in the transducer units being equal, but the phase shift in one of every two of those transducer units which are situated at equal odd multiples of the distance (d_1) from the central transducer unit differing by 180° from one another, the conversion factors being selected to produce a substantially frequency and direction-independent conversion of the sound waves when an index x (x being an interger in the range of 1 to $k+1$) is assigned to a plurality of the transducer units, the index 1 being assigned to one of the extreme transducer units, consecutive indices to consecutive adjacent transducer units, proceeding from said extreme transducer unit to the central transducer unit with the highest index assigned to the central transducer unit, and wherein the ratios between the conversion factors A_x assigned to the transducer units satisfy the equation $A_1:A_2:A_3:A_4:A_5 = 1:2n:2n^2:n^3-n:\frac{1}{4}(n^4-1)-2n^2$, wherein n has a value not equal to zero.

4,399,329

STEREOPHONIC BILINGUAL SIGNAL PROCESSOR

James H. Wharton, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 325,044

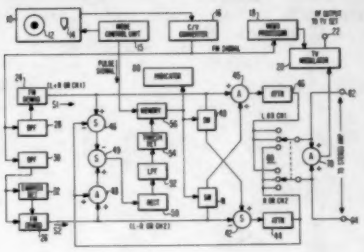
Int. Cl.³ H04N *5/60;* **H04H** *5/00*

U.S. Cl. 179—1 GB **10 Claims**

1. Apparatus for processing first and second audio input signals of either a matrixed stereophonic form wherein each signal comprises first and second common components or of an unmatrixed form wherein each signal comprises a respective independent component, said apparatus comprising:

first means for linearly combining said audio input signals in predetermined proportions to provide a resultant audio signal exhibiting a null condition when said input signals are of said matrixed form and a non-null condition when said input signals are of said unmatrixed form; and

second means for detecting said null and non-null conditions of said resultant audio signal and providing an indicator signal having a first condition indicative of said matrixed



form of said input signals and a secod condition indicative of said unmatrixed form of said input signals.

4,399,330

COMMUNICATIONS SYSTEM, IN PARTICULAR A TELEPHONE SYSTEM, FOR CONNECTING MOBILE SUBSCRIBER TERMINAL DEVICES

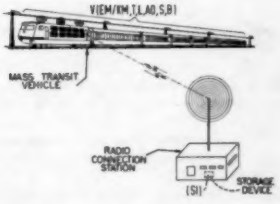
Roland Kuenzel, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,018

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034066

Int. Cl.³ G11B *13/00*

U.S. Cl. 179—2 EB **14 Claims**



1. A communications system comprising:

a vehicle;

a stationary station, including location storage means for a plurality of users;

radio connection means in said vehicle for establishing radio connections with said stationary station;

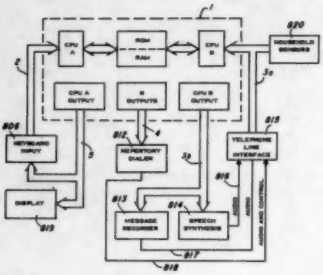
at least one subscriber terminal in said vehicle, assigned a terminal call code, for radio/telephone communications via said radio connection means and said stationary station, including an identification reading device, means for storing a user code, and means for transmitting a user code and a location code to said storage means of said stationary station, and

at least one display and corresponding acoustic signal generator in said vehicle connected to said terminal and operable to alert a user of an incoming call.

4,399,331
TELEPHONE MICROPROCESSOR SYSTEM

Sammy K. Brown, Midland, Tex.; Duane Solimeno, Newington, Conn.; Peter L. Koeppen, Houston, and Gerald Rogers, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1981, Ser. No. 263,239
Int. Cl.³ H04M *11/04, 1/64, 11/10, 1/27*
U.S. Cl. 179—5 R 8 Claims

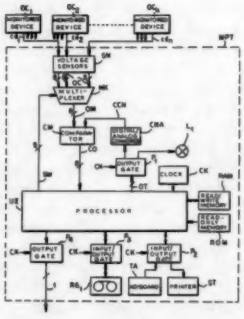


1. An electronic telephone comprising:
keyboard input means;
telephone line interface means;
message recorder means connected to telephone line interface;
speech synthesis means connected to telephone line interface;
an electronic digital processor system further comprising:
memory means for storage of data and commands which define operations on said data;
arithmetic and logic means for performing said operations on said data;
first and second independent and simultaneously operable central processing units for executing said commands on said data;
control circuitry for obtaining from said memory said commands and said data and transferring said commands to said first and said second central processing units;
first input means coupled to said keyboard means for providing telephone number inputs to said first central processing unit;
first output means coupled to said keyboard means for acknowledging the said input telephone numbers;
second input means coupled to said telephone line interface to detect incoming telephone calls;
second output means connected to said message recorder to activate said message recorder to record said incoming telephone calls;
third output means coupled to said speech synthesis
display means;
telephone line interface means;
repertory dialer means coupled to said telephone line interface means;
speech synthesis means coupled to said telephone line interface means;
message recorder means coupled to said telephone line interface means;
an electronic digital processor system further comprising:
memory means for storage of data and commands which define operations on said data;
arithmetic and logic means for performing operations on said data;
first and second independent and simultaneously operable central processing units for executing said commands on said data;
control circuitry for obtaining from said memory said commands and said data and transferring said commands to said first and to said second central processing units;
first input means coupled to said keyboard means to input a telephone number to said first central processing unit;
first output means coupled to said keyboard input means and display means to acknowledge the input of said telephone number to said keyboard means and to display said telephone number on said display means;
second input means coupled to said telephone line interface means to receive occurrence of an incoming telephone call;
means to activate speech synthesis audio connection to means to answer said incoming telephone calls with a predetermined speech syntheseis message;
a plurality of data paths that couple said first central processing unit to said memory means, said arithmetic and logic means, said first input means, said first output means, and said third output means; and couples said second central processing unit to said memory means, said arithmetic and logic means, said second input means, said second output means, and said third output means.

4,399,332
PROGRAMMABLE TRAFFIC-MEASURING UNIT FOR TELECOMMUNICATION SYSTEM

Antonio Furlan; Francesco Thiella, and Flavio Tibaldo, all of Venezia-Mestre, Italy, assignors to SIP - Societa Italiana per L'Esercizio Telefonico p.a., Turin, Italy

Filed Jun. 1, 1981, Ser. No. 268,853
Claims priority, application Italy, Jun. 3, 1980, 67860 A/80
Int. Cl.³ H04M *3/36*
U.S. Cl. 179—8 A 12 Claims



1. A circuit arrangement for checking and recording voltage changes occurring at a multiplicity of sources in a telecommunication system, comprising a measuring unit which includes:
a multiplicity of voltage sensors connectable to respective sources and provided with outgoing leads carrying output voltages which vary within a predetermined range with the voltages of said sources, said outgoing leads being combined into sets each containing a plurality of leads whose output voltages alternate between predetermined levels;
a processor programmed to emit switching signals on a first output for cyclically scanning said sets of leads and to emit coded voltage thresholds coincidentally therewith on a second output, said sets of outgoing leads having respective voltage thresholds assigned thereto;
multiplexer means with a switching input connected to said first output, a multiplicity of arrays of data inputs respectively connected to said sets of leads and an output multiple carrying the output voltages of the currently scanned set of leads;
a digital/analog converter connected to said second output

for translating said voltage thresholds into respective reference voltages lying between the predetermined voltage levels of the set of leads being scanned;

comparison means with inputs connected to said output multiple and to said digital/analog converter for delivering a multibit word to said processor in response to each emitted switching signal, each bit of said word representing in binary terms the relationship between the output voltage of a respective lead of the currently scanned set and the corresponding reference voltage; and

recording means controlled by said processor for registering the information conveyed by the bits of each word.

4,399,333

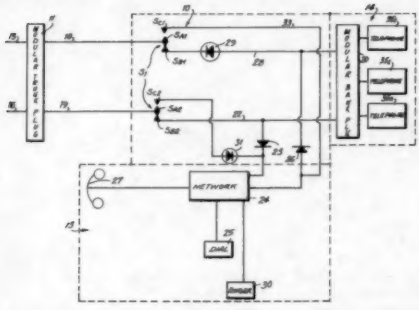
TELEPHONE FAULT DETECTION SYSTEM

Steven Gewitz, Bayside, N.Y., and Raymond Z. A. Elia, Tenafly, N.J., assignors to Teltec Inc., Tenafly, N.J.

Filed Jul. 30, 1981, Ser. No. 288,571

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 F **12 Claims**



1. A telephone fault detection system for in-line installation with at least one trunk line comprising internal telephone means having first monitoring means and telephone means, switching means coupled in-line between the monitoring means and said trunk line, said switching means being disposed in a first normally operative mode for coupling said trunk line to said monitoring means and said telephone means, said switching means being adapted to be disposed into a second test mode for maintaining said monitoring means coupled to said trunk line and for decoupling said trunk line from said telephone means, said monitoring means being adapted to provide an indication of fault detection on the trunk line side of said switching means when said switching means is disposed in said second test mode, said monitoring means being adapted to provide an indication of a fault condition when said in-line switching means is disposed in said first normally operative mode, said monitoring means including a telephone monitoring handset and said telephone means including at least one additional telephone handset.

4,399,334

SPEAKER UNIT FOR HEADPHONES

Tsutomu Kakiuchi, Toda, and Yoshiyuki Kamon, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,442

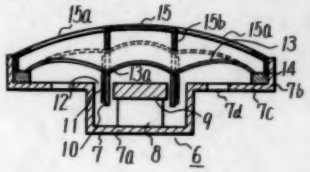
Claims priority, application Japan, Apr. 17, 1980, 55-52135[U]

Int. Cl.³ H04R *7/26*

U.S. Cl. 179—180 **7 Claims**

1. A speaker unit comprising,

a frame, a magnetic circuit having a magnetic gap mounted in said frame, a diaphragm with its outer edge mounted to said frame, a bobbin wound with a voice coil connected to said diaphragm and disposed within said magnetic gap, and protecting means attached to said frame and disposed at the front of said diaphragm, said protecting means having at least one opening and one projection on the side of said diaphragm, and said protecting means engageable



with said diaphragm only when said diaphragm is overdriven, wherein said projection is aligned with the edge of said bobbin so as to limit the movement of said voice coil, said bobbin and said diaphragm.

4,399,335

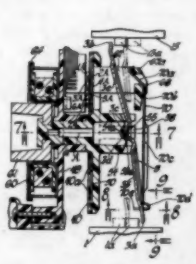
SWITCH ACTUATOR ASSEMBLY

Ronnalee House; John Delaplane, and Ronald G. Davis, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1981, Ser. No. 289,788

Int. Cl.³ H01H *19/54, 21/80, 51/08*

U.S. Cl. 200—11 R **5 Claims**



1. A rotatable switch actuator assembly comprising:

a rotor supported for rotation about a central axis and registerable with any one of a plurality of fixed switch actuators movable in generally axially directions;

an elongated unitary arm of a rigid material having a transverse arcuate portion defining a convex and a concave arcuate bearing surface substantially at its longitudinal center;

a support means carried by said rotor that is substantially centered about and extends in the direction of said central axis, said support means defining at least one arcuate bearing surface having an axis that substantially intersects said central axis and accommodates said convex bearing surface of said arm whereby said arm is tiltably supported by said rotor about an axis of tilt;

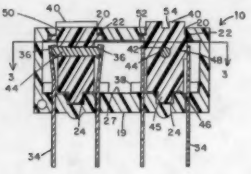
a retaining pin disposed within said concave bearing surface of said arm; and

a pair of resiliently spreadable retaining pin accommodating members carried by said rotor extending substantially in the direction of said central axis on opposite sides of said support means, each said retaining pin accommodating member having a shoulder extending toward said central axis at a location to overlay respective ends of a said retaining pin to provide snap-in assembly thereof.

4,399,336
MINIATURE ROTARY SIP SWITCH FOR MOUNTING ON A PRINTED CIRCUIT BOARD

James E. Greve, South Bend, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Sep. 24, 1981, Ser. No. 305,092
Int. Cl.³ H01H *19/10, 21/18*
U.S. Cl. 200—11 R 15 Claims

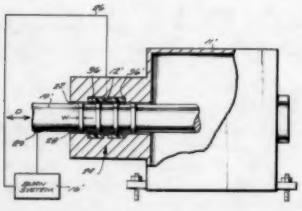


1. A miniature rotary SIP switch which maximizes the number of switch contacts per unit volume of switch package, comprising a housing having a front surface and a back surface in substantially parallel relationship and surfaces disposed between said parallel surfaces to form ends of said housing, said housing having an aperture at one end thereof and receiving means disposed oppositely from said aperture, oppositely disposed terminal and contact leaf means, each terminal and contact leaf means fixedly secured to said housing with the terminal means extending exteriorly of said housing and the contact leaf means disposed interiorly of said housing, rotary driver means having mounting means, actuation means, and laterally free-floating self-centering contact means disposed in said rotor and substantially perpendicular to the longitudinal plane of said driver, the mounting means disposed in the receiving means of said housing and the actuation means journalled in said aperture for exterior actuation of said driver whereby rotation of the driver effects biased wipable engagement of the contact means with said oppositely disposed contact leaf means to complete an electrical circuit across said terminal and contact leaf means and said contact means.

4,399,337
TRANSMISSION SELECTOR ROD SEAL

Gerald A. Annis, Pittsford, N.Y., assignor to Schlegal Corporation, Rochester, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,507
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 B 22 Claims

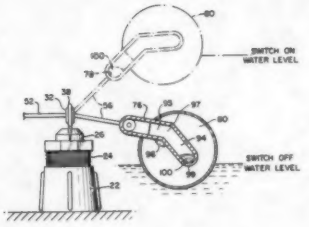


1. A transmission selector rod assembly including
a housing;
a transmission selector rod;
means defining an opening into said housing for receipt of the transmission selector rod, to allow the selector rod to move with respect to said housing;
means for providing a seal at said opening to engage the selector rod and seal said housing from the surrounding environment, and including a pile fabric strip having at least some electrically conductive fibers, and means for mounting said fabric strip surrounding said opening so that the pile thereof, including at least some electrically conductive fibers, extends radially inwardly from a position surrounding said opening, to engage the selector rod when received within the opening; and
an electrical conductor electrically connected to said fabric strip and extending away from said housing, to provide an electric circuit with said fabric strip and an accessory electrical component.

4,399,338
AUTOMATIC FLOAT SWITCH

Clarence L. Jones, Ft. Pierce, Fla., assignor to Ocean Research Industries of North America, Ft. Pierce, Fla.

Filed Sep. 22, 1981, Ser. No. 304,599
Int. Cl.³ H01H *35/18*
U.S. Cl. 200—84 R 10 Claims



1. An automatic float switch for controlling the flow of electrical current to an electrical device in response to changing liquid levels comprising:
(a) base means;
(b) resilient fulcrum means supported on said base means;
(c) flexible electrical current carrying means supported for pivotal movement about said fulcrum means, said current carrying means comprising at least two electrical conductors;
(d) a float member including an electrical switch assembly and an angled race, said conductors terminating within said switch assembly as spaced apart electrical contacts, said race having one end communicating with said switch assembly and the other end remote from said switch assembly within said float member, said float member adapted to pivot about said fulcrum means between first and second positions in response to changing liquid levels; and
(e) electrically conductive flowable material within said race for flow therealong between the ends thereof, said material occupying said remote end of said race when said float member is in a first position and flowing into said switch assembly when said float member is in a second position, whereby said material bridges said space between said spaced apart contacts in said switch assembly to permit current flow to said electrical device.

4,399,339
ELECTRICAL CONTACT

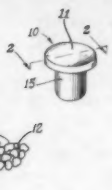
William F. Storm, Libertyville, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Mar. 2, 1981, Ser. No. 239,216
Int. Cl.³ H01H *1/02*
U.S. Cl. 200—264 7 Claims

1. An electrical contact comprising:
a contacting surface, adapted for repeated engagement with a conductive element and defined by grains of electrically conductive material;

a plurality of voids defined by said grains; and

a corrosion retarding fluid deposited in at least some of said voids, said fluid maitaining its liquid state for all switching



operations of said contact, so that the fluid passes from said voids onto said contacting surface as said contacting surface becomes eroded upon repeated engagement by said conductive element.

4,399,340

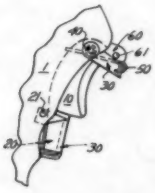
GUARD FOR A TRIGGER SWITCH

Norma M. Crandall; Raymond H. Doyle, both of Sidney, and Walter F. Kunkler, Otego, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 8, 1981, Ser. No. 261,812

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—334 **4 Claims**



1. In combination with a trigger switch of the type having: a pistol grip shaped housing; a first trigger switch mounted in an upper forward part of the housing; a second trigger switch mounted immediately below said first trigger switch; a trigger guard for said second trigger switch; means for pivotally mounting said trigger guard at one end thereof to said housing above said first switch so that said guard may be moved from a first lower position that protects said second switch from being operated to a second upper position that allows said second switch to be operated; and means for biasing said guard towards said first position, the improvement comprising:

a member fixedly mounted to said housing adjacent said guard and extending between said first and second positions of said guard, said member including an integral projection thereon that extends in a direction towards said guard, said projection adapted to engage said guard when said guard is moved between said first and second positions, said projection being sized to provide enough force between said member and said guard, to prevent said biasing means from returning said guard to said first position unless additional force is supplied to said guard by an operator of said trigger switches.

4,399,341

MICROWAVE HEATING APPARATUS

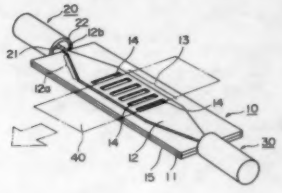
Yoshio Yasuoka, Hirakata, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 27, 1981, Ser. No. 287,054

Claims priority, application Japan, Aug. 6, 1980, 55-108644; Nov. 19, 1980, 55-163751; Dec. 16, 1980, 55-178332; Apr. 3, 1981, 56-50798; Apr. 3, 1981, 56-50799

Int. Cl.³ H05B *6/64;* H01P *3/08*

U.S. Cl. 219—10.55 R **25 Claims**



1. A microwave heating apparatus for heating sheet-like materials, comprising:

first microstripline means having a center conductor and at least one ground conductor having a dielectric layer therebetween, at least one of said center conductor and said ground conductor including a ladder delay circuit portion,

microwave supply means for supplying a microwave to said microstripline means, and

means for bringing a material to be heated to the vicinity of said ladder delay circuit portion.

4,399,342

GRATING AND METHOD OF PRODUCTION THEREOF

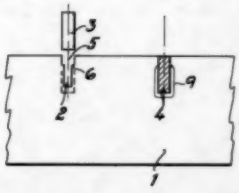
Klaus Ritter; Hans Gött; Gerhard Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs u.-Verwertungs Gesellschaft mbH, Graz, Austria

Filed Sep. 16, 1981, Ser. No. 302,553

Claims priority, application Austria, Sep. 19, 1980, 4695/80

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—58 **4 Claims**



1. A method of producing a grating comprising a first family of metal strips, each of said strips defining top and bottom edges and first and second sides extending between said edges, each strip standing on its bottom edge parallel with each other strip and defining a plurality of slots, each slot defining a first end opening into said top edge of said strip; and, at right angles thereto, a second family of narrower metal strips likewise parallel with one another and which are inserted into said slots in said strips of said first family and terminate flush with said top edges of said strips of said first family, in which said slots of said strips of said first family are formed with changing width, said width of said slots at one end of said slots being greater than, and said width of said slots at the other end of said slots less than the thickness of said strips of said second family, said slots in said first family of strips defining near said open ends of said slots sides parallel with one another, spaced apart

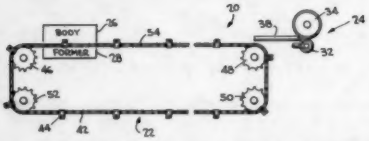
for a distance which is only slightly greater than said thickness of said strips of said second family, and the insertion of said strips of said second family into said slots in said strips of said first family being effected by applying a welding voltage serving for resistance welding together said strips of said two families and by the action of pressure in the direction of insertion, whereupon material driven out from edges defined by said slots forms weld beads at points of intersection of said strips up to a point near said open end of the slot.

4,399,343

METHOD AND APPARATUS FOR RESISTANCE WELDING OF CANS

Jakob Muller, St. Blaise, and Peter Schreiber, Nidau, both of Switzerland, assignors to Fael SA, Saint-Blaise, Switzerland

Filed Apr. 13, 1981, Ser. No. 253,488
Int. Cl.³ B23K *11/32, 11/06*
U.S. Cl. 219—64 **11 Claims**



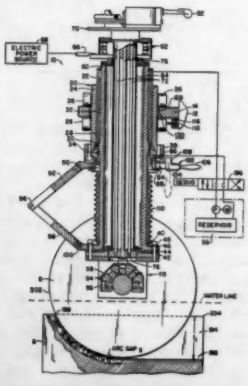
1. In a welder for side seams of tubular bodies of the type including cans, a pair of cooperating roller electrodes defining a welding nip for simultaneously advancing a tubular body at a preselected speed and effecting the welding of a side seam of the tubular body, apparatus for supplying rolled unseamed tubular bodies; a single conveyor defining means for (1) receiving unseamed tubular bodies at regularly spaced intervals along said conveyor, (2) moving the unseamed tubular bodies toward said nip at a speed materially greater than the speed of said nip, and (3) reducing the speed of movement of the tubular body to substantially the speed of said nip immediately before said nip.

4,399,344

METHOD OF OPERATING HIGH SPEED ELECTRIC ARC SAW

Max P. Schlienger, Ukiah, and Whalun Szeto, Novato, both of Calif., assignors to Retech, Inc., Ukiah, Calif.

Continuation-in-part of Ser. No. 793,991, May 5, 1977. This application Jun. 22, 1981, Ser. No. 276,322
Int. Cl.³ B23P *1/00*
U.S. Cl. 219—68 **14 Claims**



6. A method for cutting a kerf in a metal object with an electric arc saw including a saw blade and a means for adjusting the cutting depth of the blade in the metal object, said method comprising:

advancing the saw blade in a first direction into close proximity with the object;

passing a cutting current I between the saw blade and the object which equals at least:

$a \cdot s \cdot 10^6$ amps wherein

a is in the range of between about 2 and about 16;

s is the effective surface area of the cut (arc segment length × kerf width) in m^2;

so that cutting of the object through melting of the metal commences substantially instantaneously upon the commencement of current flow between the member and the object;

returning the saw blade opposite to the first direction through the kerf so that debris formed during the cutting stroke is removed therefrom;

moving the blade to increase its cutting depth after completion of the returning step; and

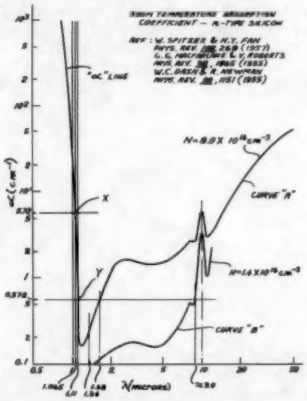
repeating the adjusting, returning and moving steps until the kerf extends to the desired depth in the object.

4,399,345

LASER TRIMMING OF CIRCUIT ELEMENTS ON SEMICONDUCTIVE SUBSTRATES

Jerome F. Lapham, and Tommy D. Clark, both of Westford, Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Jun. 9, 1981, Ser. No. 272,054
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LJ **7 Claims**



1. The method of laser trimming of elements on a doped semiconductive substrate, wherein a laser beam is directed onto the element from the side of the substrate carrying the element and is so controlled as to vaporize or otherwise remove or alter the material of the element so as to achieve a predetermined electrical characteristic for the element; said method further comprising the step of setting the frequency of the laser at a value no greater than E_g/h, where E_g is the optical band-gap energy of the doped substrate and h is Planck's constant.

4,399,346

OPTOELECTRONIC WELD TRAVEL SPEED SENSOR

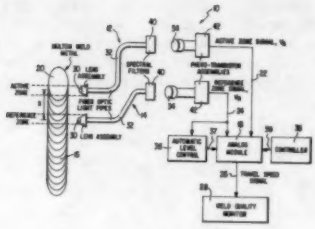
Frank W. Kearney, 1011 W. White St., Champaign, Ill. 61820

Filed May 29, 1981, Ser. No. 268,219
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.01 **15 Claims**

1. A weld speed monitoring system adapted to be utilized

with a welding apparatus producing a continuous weld bead along a surface, which system comprises:

first sensor means for receiving radiation emitted from said weld bead in a first zone and for producing a first signal indicative of the level of the radiation emitted from said first zone;



second sensor means for receiving radiation emitted from said weld bead in a second zone and for producing a second signal indicative of the level of said radiation emitted from said second zone, wherein said second zone is disposed in spaced relation to said first zone along said weld bead; and

comparator means for producing an output signal in accordance with said first and second signals.

4,399,347

DEVICE FOR ATTACHMENT TO MOTOR VEHICLE WINDOWS TO PREVENT FOGGING OR ICING

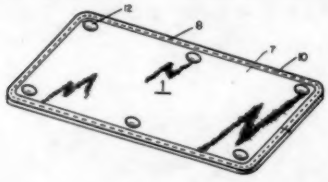
Wilhelm Schmitt, Heppenheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Apr. 29, 1981, Ser. No. 258,764

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024470

Int. Cl.³ H05B *3/36;* B60J *1/20;* E06B *7/12*

U.S. Cl. 219—203 **11 Claims**



1. In combination with a transparent body having an outer surface exposed to ambient atmosphere and an inner surface exposed to a confined atmosphere; a device for preventing icing or fogging, comprising:

a planar structure having front and back sides, a layer of reflecting material on said front side, and a length and width coterminus with said body, said front side facing said inner surface; and

holders affixed to said structure, extending outward from said front side at a distance of from about 5 to 15 mm, and detachably mounted upon said inner surface of said body so as to position said structure and said inner surface essentially parallel, overlapping and at a distance of from about 5 to 15 mm apart to create a convective flow space therebetween; thereby preventing moisture or ice deposit on said body.

4,399,348

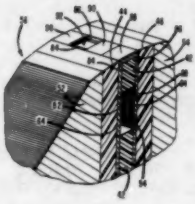
THERMAL PRINT HEAD AND METHOD OF FABRICATION

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed May 21, 1981, Ser. No. 265,978

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—216 **14 Claims**



1. A thermal print head comprising:

a pair of opposing substrates having top edges in one plane and a dielectric spacer sandwiched therebetween to produce a sandwiched structure extended in one direction, said dielectric spacer having recesses at the edge associated with the top edges of said opposed substrates;

resistive material located within said recesses to a level flush with the top edges of said opposing substrates thereby to form recessed thermal print elements;

means for applying power to selected thermal print elements; and

wherein said spacer includes at least one channel running beneath said recesses, and further including means for flowing fluid through said channel for the cooling of said thermal print elements.

4,399,349

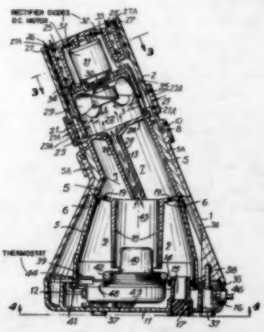
ELECTRICALLY HEATED FACIAL SAUNA APPLIANCE

Loretta M. Deming, Stamford, and Raymond W. Kunz, Monroe, both of Conn., assignors to Clairol Inc., New York, N.Y.

Filed Mar. 30, 1981, Ser. No. 249,052

Int. Cl.³ A61H *33/12;* F22B *1/28;* H05B *3/00*

U.S. Cl. 219—276 **20 Claims**



1. A vapor generating device comprising:

a housing including a base portion and an upper portion extending from said base portion, said base portion having an upright use position and an inverted filling position, said base portion having an inlet suitable for receiving liquid therethrough when in said inverted filling position, said upper portion having an outlet portion;

container means within said housing communicating with

said inlet for containing liquid received therein through said inlet;

electrically energized vaporizing means at least partly disposed in said container means for vaporizing the liquid; and

at least one passageway interconnecting said container means to said outlet portion for conveying the liquid and vapor to said outlet, said container means and at least one passageway being so configured and arranged that said liquid outlets through at least part of said outlet portion upon the filling of said container means beyond a certain volume when said base portion is in said inverted position, said at least one passageway being oriented relative to said container means so as to retain at most said certain volume within said container means when said housing is in any position subsequent to said filling.

4,399,350

PROCEDURE FOR THE THERMAL TREATMENT OF POWDERED AND GRANULATED CATALYSTS AND THE LIKE

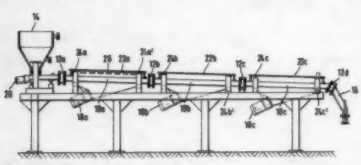
Michael Schneider, Ottobrunn-Riemerling; Karl Kochloefl, Moosburg; Gerhard Diez, Munich; Franz Maier, Bruckmühl-Heufeld; Josef E. Rauch, and Wolfgang Liebelt, both of Moosburg, all of Fed. Rep. of Germany, assignors to Süd-Chemie A.G., Munich, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 273,197

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022330

Int. Cl.³ F27B *9/06*

U.S. Cl. 219—388 **14 Claims**



1. A process for the thermal treatment of powdered or granulated particles of catalytically related material, which comprises the steps of:

A. feeding said material in a thin layer onto a reciprocating and vibrating trough conveyor;

B. imparting a reciprocating and vibratory motion to said conveyor trough and to said powdered material on said trough;

1. said reciprocating motion having a vertical component and a horizontal component and,

2. said vertical component being smaller than said horizontal component so as to move said material along said conveyor,

C. applying heat to the material moving in a harmonic and vibratory fashion along said conveyor trough;

D. thereafter allowing said thermally treated particles to cool.

4,399,351

ELECTRIC HEAT EXCHANGE COOKING APPARATUS

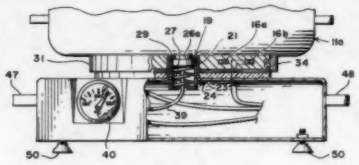
William Koff, 2100 S. Ocean La., Ft. Lauderdale, Fla. 33316

Continuation-in-part of Ser. No. 213,271, Dec. 5, 1980, abandoned. This application Oct. 15, 1981, Ser. No. 311,365

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—433 **7 Claims**

1. An electric cooking system for use, selectively, with one at a time of plurality of different cooking receptacles, comprising, in combination, a heat exchange member, said heat exchange member having an upper heat exchange surface, housing means for supporting said heat exchange member, a layer of thermal insulation between the underside of said heat exchange member and said housing means, a plurality of cooking receptacles, each for a different cooking purpose, each of said cooking receptacles having a heat exchange undersurface area, a heat collector base member fixed with respect to said heat exchange undersurface, said heat exchange undersurface having substantially the same surface configuration as that of said upper heat exchange surface, means for releasably interconnecting said heat collector base members and their respective associated cooking receptacles, one at a time, with said heat exchange member so that their respective heat exchange surfaces are in intimate contact, said heat exchange member being circular and of cast metal, an electrical heating element embed-



ded in said cast metal, said electrical heating element being of elongated configuration bent to define substantially circular, concentric, inner and outer electric heating element portions within said cast metal, a cylindrical electrical sensor projecting upwardly through a central opening in said cast metal and being thermally insulated from said cast metal, resilient means urging the upwardly-projecting surface of said electrical sensor into intimate abutting contact with the heat exchange surface of a selected cooking receptacle interconnected with said heat exchange member, means for measuring the temperature sensed by said electrical sensor, and means for energizing said heating element.

4,399,352

HEATING DEVICE WITH SEPARATE DISPLAY MEANS FOR THE TYPES OF DATA ENTERED

Shigeki Ueda, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

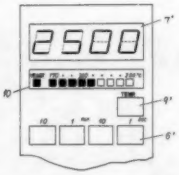
PCT No. PCT/JP79/00117, § 371 Date Jan. 3, 1980, § 102(e) Date Jan. 3, 1980, PCT Pub. No. WO79/01058, PCT Pub. Date Dec. 13, 1979

PCT Filed May 10, 1979, Ser. No. 185,913

Claims priority, application Japan, May 12, 1978, 53-56912

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—506 **3 Claims**



1. A heating device, comprising:

a heating chamber for receiving an object to be heated;

at least one heat source for heating said object;

a main controller for controlling said heat source to heat said object;

time input means for setting a heating time for said object into said main controller;

time display means comprising a first plurality of indicator segments for indicating the heating time controlled by said controller;

temperature input means for setting a heating temperature into said main controller, said temperature input means having a single temperature key and count means for

counting one of (a) the number of times said temperature key is repetitively depressed and (b) the period of time during which said temperature key is maintained in its depressed state, said main controller setting the heating temperature in correspondence with one of the number of times said temperature key is repetitively depressed and the period of time during which said temperature key is maintained in its depressed state;

temperature display means comprising a second plurality of indicator segments for indicating the heating temperature controlled by said main controller; and

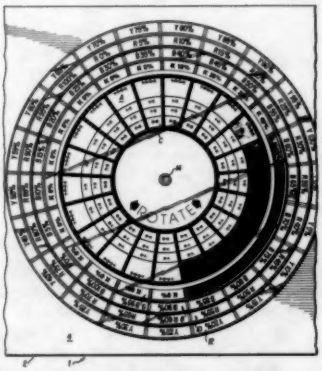
clock setting means for setting the hour of the day on said time display means, said time display means normally displaying the hour of the day and said temperature display means being maintained in a non-actuated mode; said time display means being switched from displaying the hour of the day to displaying the heating time and said temperature display means being switched from said non-actuated mode to an initial display mode upon operation of said single temperature key, further operation of said single temperature key displaying the desired heating temperature on said temperature display means.

4,399,353

COLOR COMPUTER WHEEL

James K. Adkins, and Charlotte G. Adkins, both of 9806 Luke Ct., Upper Marlboro, Md. 20772

Filed Jul. 23, 1981, Ser. No. 285,913
Int. Cl.³ G06C *27/00*
U.S. Cl. 235—78 R **6 Claims**



1. A wheel for comparing colors and computing color combinations, comprising:

a light colored base member;

a set of four circular, concentrically arranged discs made of transparent material rotatably mounted upon and secured to said base member by fastener means passed through the common centerpoints of said discs, whereby said four discs can each be independently rotated in either direction;

said four discs being of progressively decreasing diameter moving from the lowermost to the uppermost thereof, the first topmost disc being a comparator disc, and each of said four discs having an annular legend strip on the periphery thereof that is not covered by any other disc, all of said legend strips being divided into the same number of circumferential spaces of equal arc length extending about the entire periphery of said discs;

the first, topmost comparator disc being smallest in diameter of said four discs and carrying thereon four concentrically arranged bands positioned inwardly of the legend strip on said disc, all of said bands being divided into the same number of radial spaces as the number of circumferential spaces in said legend strips and said radial spaces of said four bands being in register with each other and with the circumferential spaces of the comparator disc legend strip, the radial spaces of the first, second and third of said bands being clear and free of color;

a portion of the adjacent radial spaces in the fourth of said four concentrically arranged bands on said comparator disc also being clear and free of color and the balance of said radial spaces in said fourth band being tinted with progressive shades of black, the circumferential spaces of said comparator legend strip carrying legends indicating the percentage of black tint for each radial space in said fourth band;

said first band on said comparator disc carrying a legend indicating that it shows colors found on a second and a third of said four discs, the second of said bands carrying a legend indicating that it shows colors found on said second and a fourth of said four discs, the third of said bands carrying a legend that it shows colors found on said third and said fourth of said four discs, and the fourth of said bands carrying a legend indicating that it shows colors found on said second, third and fourth of said four discs, together with whatever percentage of black tint is found in the radial spaces of said fourth band;

said second of said four discs having three concentric annular color bands thereon, positioned to underlie said first, said second and said fourth of said bands on said comparator disc, each of said color bands on said second disc being divided into the same number of equal arc length radial spaces as the number or circumferential spaces in said legend strips, the radial spaces of said three annular color bands being in register with each other and with the circumferential spaces of the legend strip on said second disc, and being tinted with progressive shades of a first primary color, each set of radially aligned radial spaces of the three annular color bands having the same shade of primary color, and the legend strip circumferential space aligned therewith carrying a legend indicating the percentage of such primary color;

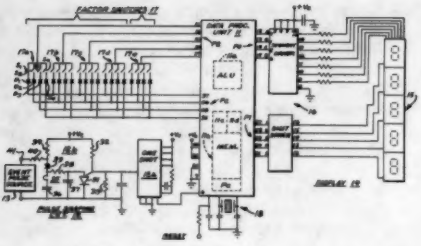
said third of said four discs having three concentric annular color bands thereon, positioned to underlie said first, said third and said fourth of said bands on said comparator disc, each of said color bands on said third disc being divided into the same number of equal arc length radial spaces as the number of circumferential spaces in said legend strips, the radial spaces of said three annular color bands being in register with each other and with the circumferential spaces of the legend strip of said third disc, and being tinted with progressive shades of a second primary color, each set of radially aligned radial spaces of the three annular color bands having the same shade of primary color, and the legend strip circumferential space aligned therewith carrying a legend indicating the percentage of such primary color; and

said fourth of said four discs having three concentric annular color bands thereon positioned to underlie the second, third and fourth of said bands on said comparator disc, each of said color bands on said fourth disc being divided into the same number of equal arc length radial spaces as the number of circumferential spaces in said legend strips, the radial spaces of said three annular color bands being in register with each other and with the circumferential spaces of the legend strip of said fourth disc, and being tinted with progressive shades of a third primary color, each set of radially aligned radial spaces of the three annular color bands having the same shade of primary color, and the legend strip circumferential space aligned therewith carrying a legend indicating the percentage of such primary color.

4,399,354
DIGITAL RATE MONITOR

Daniel Schaeffer, Chicago, Ill., assignor to Vorne Industries, Inc., Chicago, Ill.

Filed Mar. 17, 1980, Ser. No. 131,249
Int. Cl.³ H03K *21/30*
U.S. Cl. 377—26 10 Claims



1. In a multirange rate monitor apparatus for receiving event signals generated by a source of event signals and for determining the rate at which the event signals are being generated, an automatic ranging arrangement comprising:

pulse generating means responsive to the event signals for generating pulses at a rate corresponding to the frequency of the event signals;

pulse accumulating means for accumulating the pulses;

interval timing means for generating timing signals defining elapsed time intervals;

means responsive to the first pulse of a series of pulses generated by said pulse generating means for clearing said pulse accumulating means and for starting said interval timing means whereby the elapsed time intervals are measured from the time of occurrence of said first pulse;

data storage means for storing timing data signals representing preselected elapsed time intervals of different durations;

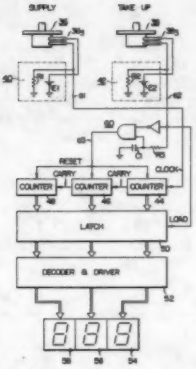
and range select means including means responsive to said pulse accumulating means accumulating a predetermined number of pulses for comparing the timing signals generated by said interval timing means with the timing data signals stored by said data storage means, and selecting means for selecting a first number of pulses indicative of a first range of operation for said rate monitor apparatus for use in determining the rate of the event signals if said predetermined number of pulses has been accumulated during a first interval of elapsed time measured from the time of occurrence of said first pulse and for selecting a second number of pulses indicative of a second range of operation of said rate monitor apparatus for use in determining the rate of the event signals if said predetermined number of pulses has been accumulated before the end of a second elapsed time interval following said first elapsed time interval,

and in the event that said predetermined number of pulses fails to be accumulated by the end of said second interval of elapsed time, said selecting means selecting a third number of pulses indicative of a third range of operation of said rate monitor apparatus for use in determining the rate of the event signals.

4,399,355
DISPLAY APPARATUS FOR TAPE RUNNING POSITIONS

Ken Satoh, and Kenzi Furuta, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 944,062, Sep. 20, 1978, abandoned. This application Dec. 23, 1980, Ser. No. 220,236
Claims priority, application Japan, Sep. 30, 1977, 52-117557
Int. Cl.³ G11B *15/43*; G06M *3/14*; H03K *27/00*
U.S. Cl. 377—18 11 Claims



1. A display apparatus for tape running positions comprising:

a tape transport system in which the rotational speeds of first and second reels vary according to an amount of running of a tape;

first generator means connected to said first reel for generating m number of pulses constituting a first signal for each revolution of said first reel;

second signal generator means connected to said second reel for generating n number of pulses constituting a second signal for each revolution of said second reel;

counter means connected to said first and second signal generator means for counting the repetitive pulse number of said first signal appearing during one cycle period of said second signal, the count operation of said counter means being carried out so that

$$Cmax - Cmin = m/n\ (N - 1/N)$$

where

Cmax denotes a maximum count of the repetitive pulse number of said first signal appearing during one cycle period of said second signal, Cmin a minimum count thereof, and N a rotational speed change of said first and second reels;

display means connected to said counter means for displaying an amount of running of the tape according to count data obtained from the count operation of said counter means;

a shift register connected to said first and second signal generator means and adapted to be clocked by said first signal and reset by said second signal; and

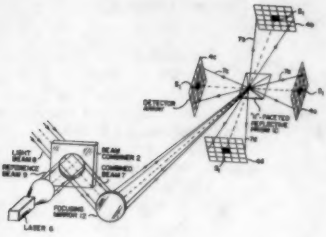
a display array including display elements connected to output terminals of said shift register in which the energizing state of said display elements varies according to an amount of running of the tape.

4,399,356

OPTICAL WAVEFRONT SENSING SYSTEM

Julius M. Feinleib, Cambridge; John K. Bowker, Beverly Farms; Lawrence E. Schmutz, Cambridge; Steven J. Tubbs, and Michael Shao, both of Watertown, all of Mass., assignors to Adaptive Optics Associates, Inc., Cambridge, Mass.

Filed Jan. 19, 1981, Ser. No. 226,038
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 35 Claims



1. Wavefront distortion sensing apparatus comprising:

(a) focusing means for focusing a first wavefront beam of energy onto a beam divider means;

(b) nutating means for nutating said first beam in a predetermined manner;

(c) beam divider means located at the focal point of said focusing means, said beam divider means forming "n"-separate beams corresponding to said first beam, where "n" is a number greater than 1;

(d) "n"-detector arrays each of which is associated with one of said "n"-separate beams such that energy from each "n"-separate beams impinges on one of each "n"-detector arrays; and

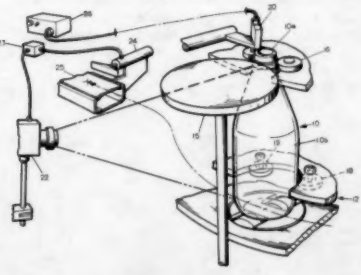
(e) "S" detector elements in each array for detecting the amount and distribution of the beam energy at "S" points in the wavefront of energy impinging on each array and wherein "S" is greater than one.

4,399,357

METHOD AND APPARATUS FOR INSPECTING GLASS CONTAINERS

Arthur L. Dorf, and Sam Lovalenti, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 22, 1981, Ser. No. 266,576
Int. Cl.³ B67C 1/14; B07C 5/00
U.S. Cl. 250—223 B 7 Claims



1. The method of inspecting glass containers and the like for horizontal checks in the sidewall thereof wherein

the containers are moved successively in upright position to and through an inspection station,

and are rotated about their vertical axes thereat, comprising

directing a source of light to which the said container is transparent, downwardly onto the top surface of the finish of said container at a limited position thereof during its rotation to illuminate a vertical section of the wall,

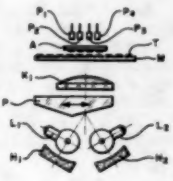
viewing the illuminated vertical section of the wall with a vertical, linear, diode array and electronically scanning the diode array while the container is rotated through at least 360° of rotation whereby a complete scan of the sidewall is made.

4,399,358

PHOTOELECTRIC DIGITAL MEASURING INSTRUMENT HAVING MULTIPLE LIGHT SOURCES

Horst Burkhardt, Truchtlaching, and Hans-Rudolf Kober, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,039
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2977162
Int. Cl.³ H01J 40/14; F21V 19/04
U.S. Cl. 250—237 G 2 Claims



1. A photoelectric length or angle measuring apparatus comprising:

a measuring scale;

a scanning unit including at least one photosensitive element for generating a scanning signal in response to light incident on a scanned region of the scale;

a first light source;

a second light source; and

means for selecting either of the first and second light sources such that light from the selected light source is directed at the scanned region of the scale;

wherein the selecting means comprises a shiftable prism, the first and second light sources are fixedly mounted with respect to the scanning unit, and the prism is shiftable between a first position, in which light from the first light source is directed by the prism at the scanned region of the scale, and a second position, in which light from the second light source is directed by the prism at the scanned region of the scale.

4,399,359

METHOD FOR MONITORING FLOOD FRONT MOVEMENT DURING WATER FLOODING OF SUBSURFACE FORMATIONS

Walter H. Ferti; Elton Frost, and Donald W. Oliver, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 8, 1980, Ser. No. 214,311
Int. Cl.³ G10V 5/00
U.S. Cl. 250—270 9 Claims

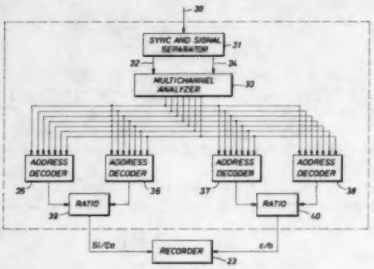
1. A method for determining the profile of a fluid flood front traveling through earth formations located between a plurality of injection wells and a production well, comprising the steps of:

traversing a plurality of monitor boreholes located between

said injection wells and said producing well with a source of high energy neutrons and a radiation detector;

irradiating the formations surrounding each of said plurality of monitor boreholes with high energy neutrons emitted from said source; detecting radiations emanating from said formations irradiated by said neutrons;

generating first electrical signals functionally related to the relative distribution of silicon to calcium contents of said



formations, said first electrical signals indicative of salinity of the water within said formations;

generating second electrical signals functionally related to the relative distribution of carbon to oxygen contents of said formations, said second electrical signals indicative of oil saturation of said formations; and

recording said first and second electrical signals for determining the arrival of said flood front at each of said plurality of monitor boreholes.

4,399,360

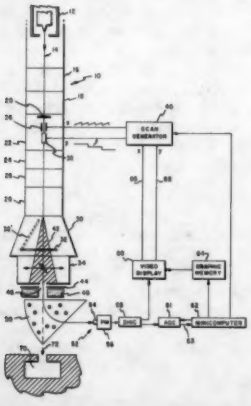
TRANSMISSION ELECTRON MICROSCOPE EMPLOYING SEQUENTIAL PIXEL ACQUISITION FOR DISPLAY

Mircea Fotino, Boulder, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 176,325, Aug. 8, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 364,353

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—311 **6 Claims**



1. In a transmission electron microscope including means for generating an electron beam of energy sufficient to illuminate but not substantially injure all or a substantial portion of a specimen to produce immediately below said specimen an instantaneous and complete image of said specimen or substantial portion thereof, the improvement comprising:

aperture defining means;

means for deflecting said complete image across said aperture defining means, at any instant said aperture defining a pixel of said image and;

electron detector means for providing, during said instant, an output indicative of the number of electrons passing through said aperture defining means as said complete image is deflected thereacross to thereby produce non-interfering pixel representations.

4,399,361

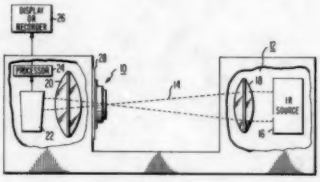
DEVICE FOR MULTISAMPLE INFRARED ANALYSIS OF MATERIALS IN MICROGRAM QUANTITY

Peter J. Zanzucchi, Lawrenceville, and William R. Frenchu, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,283

Int. Cl.³ G01N *21/26*

U.S. Cl. 250—343 **8 Claims**



1. In a microsampling apparatus for infrared (IR) spectroscopy of the type having means for providing an IR beam to indicate a sample of material, optical means for focusing said beam on said sample, and means for subsequently processing the IR beam to provide information representing the ingredients of the material, wherein the improvement comprises:

a base plate mounted at the focal point of said beam and an aperture in said plate for passing said IR beam; and

means attached to said base plate for supporting a moveable IR-transparent substrate;

said substrate arranged to receive one or more samples of material at locations on said substrate moveable to an optical register position over said aperture to pass said beam.

4,399,362

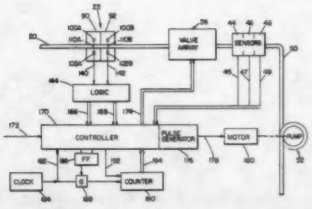
LIQUID HANDLING APPARATUS

Alan D. Cormier, Newburyport; John D. Czaban, Bradford; Thomas J. Schillinger, Stoughton; Kenneth D. Legg, Wellesley, and Thomas F. Kelley, Canton, all of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Feb. 27, 1981, Ser. No. 239,025

Int. Cl.³ G01N *21/01*

U.S. Cl. 250—430 **8 Claims**



1. A system for analyzing a biological fluid comprising

an analysis region,

a measurement system connected in sensing relation to said analysis region,

a sample flow path connected between a sample inlet port and said analysis region,

a pump for flowing sample to be analyzed through said sample flow path to said analysis region,

a gas-liquid interface sensor in said flow path, said sensor having a first output when blood is in said flow path, a second output of magnitude different from the magnitude of said first output when serum is in said flow path, and a third output of magnitude intermediate the magnitudes of said first and second outputs when air is in said flow path, and

control means for operating said pump at a first rate and responsive to said interface sensor for positioning the leading edge of a sample of fluid to be analyzed at a predetermined location in said sample flow path and then operating said pump at a second rate different from said first rate determined by the type of fluid detected by said sensor for positioning the sample in said analysis region with the trailing edge of the sample at a second predetermined location in said sample flow path.

4,399,363

MEANS FOR CONVERTING X-RAYS INTO RADIATION WHICH DARKENS X-RAY FILMS

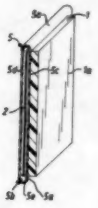
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 21, 1980, Ser. No. 199,377

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943854

Int. Cl.³ G01J *1/58*

U.S. Cl. 250—483.1 **6 Claims**



1. A flexible laminate for conversion of X-rays into radiation which effects darkening of X-ray film, comprising a flexible plate; a fluorescent layer at one side of said plate; a receptacle adjacent to the other side of and secured to said plate; and a flexible ferromagnetic layer in said receptacle.

4,399,364

DIAMOND TREATMENT

Trevor Evans, 8 Oaklands, Bulmershe Rd., Reading, and Brian P. Allen, 52 Leicester Rd., Sapcote, Leicestershire, England

Continuation of Ser. No. 109,407, Jan. 3, 1980, abandoned. This application Sep. 15, 1981, Ser. No. 302,398

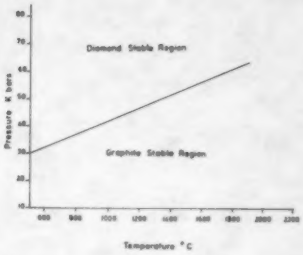
Claims priority, application United Kingdom, Jan. 17, 1979, 7901728

Int. Cl.³ B01J *3/06*

U.S. Cl. 250—492.1 **9 Claims**

1. A method for reducing the color of type 1B diamonds containing dispersed nitrogen, which dispersed nitrogen imparts to said diamonds a color ranging from yellow to green, the method includes the step of heat treating said diamonds at a temperature in the range of 1,600° C. to 2,200° C. under a pressure at which said diamonds are crystallographically stable at the particular temperature employed, said heat treatment being continued so as to effect aggregation of the dispersed nitrogen and thereby reduce the color of said diamonds, the improvement comprising in combination with said heating step the additional step of:

reducing the time required for said heat treatment step to achieve said color reduction by employing an exposing step prior to said heat treatment step, said exposing step



comprising exposing the diamond to irradiation of sufficient strength to cause atomic displacements in said diamond and continuing said irradiation until atomic displacement occurs, the flux of said irradiation being such as to produce at least 10^{+18} vacancies per cubic centimeter in said diamond.

4,399,365

ION IMPLANT CHAMBER FOR ION IMPLANTATION SYSTEM

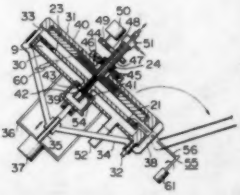
Takeshi Koike, Ibaraki, and Atsushi Shibata, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,370

Claims priority, application Japan, Mar. 13, 1980, 55/32493

Int. Cl.³ G21G *5/08*

U.S. Cl. 250—492.2 **19 Claims**



1. An ion implant chamber for an ion implantation system for implanting ion emitted from an ion source into a wafer, comprising:

a vacuum case capable of being hermetically sealed;

a first rotating disc supported in said vacuum case;

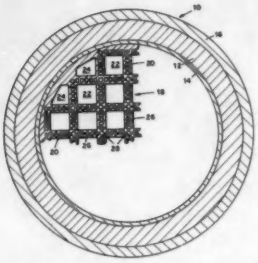
a second rotating disc arranged coaxially with said first rotating disc, said second rotating disc being able to hold a wafer by keeping said second rotating disc in close contact with said first rotating disc; and

a driving source for rotating said first and second rotating discs.

4,399,366
SEPARATOR ASSEMBLY FOR USE IN SPENT NUCLEAR FUEL SHIPPING CASK

James A. Bucholz, Oak Ridge, Tenn., The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,030
Int. Cl.[3] G21F 5/00; G21C 3/34
U.S. Cl. 250—507.1 8 Claims

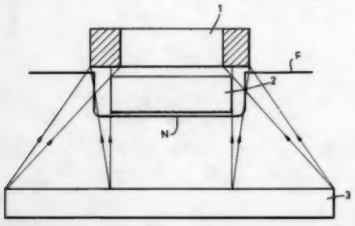


1. A system for use in handling nuclear fuel, comprising;
a honeycomb-type wall structure defining a plurality of elongate, parallel cavities each shaped to receive a nuclear fuel assembly; and
a plurality of tubes extending through said wall structure and disposed around each of said cavities therein, said tubes being formed of an effective neutron-absorbing material and being filled with a moderator fluid so as to constitute neutron flux traps.

4,399,367
PROCESS AND APPARATUS FOR DETECTING AND SORTING OUT INAPPROPRIATELY FILLED PACKAGES OF FILLER MATERIAL DURING A PACKAGING PROCESS

Gerhard Grube, and Heinz Engelke, both of Loehne, Fed. Rep. of Germany, assignors to Otto Haensel GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,660
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935153; Aug. 31, 1979, 2935154
Int. Cl.[3] G01N 21/86
U.S. Cl. 250—560 12 Claims

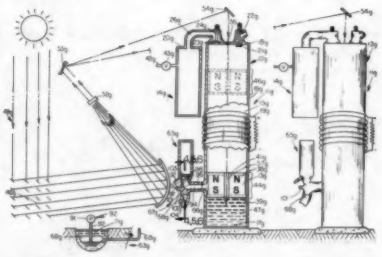


1. A process using a radiation source, a radiation receiver and a sorting apparatus for detecting and sorting out packages of filler material inappropriately filled during movement of said packages through a packaging machine wherein each of said packages comprises a cover foil and a radiation permeable bottom foil having a plurality of spaced nests formed therein for holding said filler material such that each of said nests is dimensioned to form a gap around said filler material after filling of said nests and wherein said process comprises:
providing said radiation receiver with an active receiving surface overlying an adjacent surface portion of said filler material such that said receiving surface is larger than said adjacent surface portion of said filler material;
irradiating diffuse radiation through said radiation permeable bottom foil and through said gap around said filler material with said radiation source so as to cast shadows of filled nests onto said receiving surface of said radiation receiver such that shadows of said nests inappropriately filled differ from shadows of said nests appropriately filled;
generating a signal with said receiver upon casting thereon said shadows of said nests inappropriately filled; and
triggering said sorting apparatus with said signal so as to sort out said inappropriately filled packages.

4,399,368
POWER PLANT AND PROCESS UTILIZING GRAVITATIONAL FORCE

Donald C. Bucknam, 2124 S. 110th St., Omaha, Douglas County, Nebr. 68144

Continuation-in-part of Ser. No. 197,314, Oct. 15, 1980. This application Mar. 15, 1982, Ser. No. 358,225
Int. Cl.[3] F03G 7/02
U.S. Cl. 290—1 R 31 Claims



1. A process for converting gas expanding energy sources into useful other forms of energy, such as inducing an alternating current in a coil, comprising the steps of:
holding a piston means forming a magnetic field and slidably operable, but otherwise unattached, within a substantially enclosed cylinder means at a starting position near a lower end thereof, by the compressive support of the vapor of a liquid in the bottom of the cylinder means, said cylinder means having a load-connected electrical conductor coil means surrounding it intermediate its ends;
lifting said piston means to an apex position near the upper end of said cylinder means by vaporizing the liquid by directing a concentrated solar beam onto it, thereby opening a spring-biased valve mounted in an outlet port in the upper end of said cylinder means in order to transfer the column of air above the piston means through a tube into a reservoir means;
lowering said piston means to said starting position, including the steps of:
discontinuing the directing of the concentrated solar beam, thereby allowing the vapor to condense and leave a vacuum below the piston means, and allowing said spring-biased valve in the outlet port to close and a spring-biased valve in an inlet port in the upper end to open in order to admit a charge of fresh air;
allowing a portion of the vapor to escape from beneath the piston means in the cylinder means to a separate hot reservoir partially filled with said liquid by a valve means for diverting the vapor when the piston means reaches the apex position;
allowing any remaining liquid or liquid vapor to escape from beneath the piston means in the cylinder means to a remote cooling condenser containing a near perfect

vacuum by the vapor diverting valve means before the piston means reaches a mid-point between the apex position and the starting position;

preventing the escape of the vapor beneath the piston into the remote cooling condenser by the vapor diverting valve means; and

allowing a portion of the vapor and liquid stored in the separate hot reservoir to return therefrom to the cylinder means beneath the piston means by the vapor diverting valve means before the piston means reaches the starting position, whereby a bounce chamber for the falling piston is provided and the liquid in the cylinder means is replenished; and

stopping the downward movement of said piston means at said starting position by compressed gas below said piston means, thereby completing a cycle which can be repeated by starting at the step in which the piston is lifted.

4,399,369

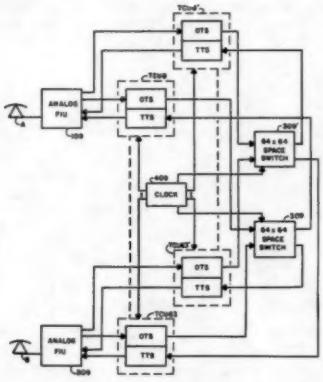
DUAL RAIL TIME AND CONTROL UNIT FOR A DUPLEX T-S-T-DIGITAL SWITCHING SYSTEM

Nathaniel Simmons; Stig Magnusson, both of Phoenix; Sergio E. Puccini, Scottsdale, all of Ariz.; Donald W. McLaughlin, Naperville, and David J. Stelte, Lombard, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 23, 1980, Ser. No. 219,550

Int. Cl.³ H04J 3/00

U.S. Cl. 307—63 **8 Claims**



1. In a duplex time-space-time switching system including first and second parallel switching networks, said switching system transmitting a plurality of PCM voice samples over each of said first and second switching networks from a first to a second telephone subscriber via subscriber interface equipment, each of said subscribers connected to each of said first and second parallel switching networks, said switching system comprising:

synchronization means;

each of said parallel switching networks including:

first and second buses connected to said subscriber interface equipment;

first and second space switching means connected to said synchronization means;

first and second terminating time switching means connected respectively to said first and second space switching means, connected to said synchronization means and connected to said subscriber interface equipment, each of said terminating time switching means operating to switch said PCM voice samples to said subscriber interface equipment;

first and second originating time switching means, connected respectively between said first and said second buses and connected to said first and second space switching means and to said subscriber interface equipment and further connected to said synchronization means, each of said originating time switching means operating to switch said PCM voice samples from said subscriber interface equipment to said first and second space switching means;

each of said originating time switching means including:

memory means connected to said first and second buses, said first and said second memory means interconnected so that said first and said second memory means are written into simultaneously in sequential time slots with said PCM samples transmitted via said buses;

said first and said second memory means further operating so that said PCM samples contained on said first bus may be switched through said second space switching means to said second terminating time switching means or alternatively said PCM samples contained on said second bus may be switched through said first space switching means to said first terminating time switching means;

said switching system further including:

said synchronization means operating to simultaneously control said operation of said first and second originating time switching means of said first switching network synchronously with said first and second originating time switching means of said second switching network;

said first and second space switching means of said first switching network simultaneously operating with said first and second space switching means of said second switching network in response to said synchronization means and to said operation of each said first and second originating time switching means; and

said first and second terminating time switching means of said first switching network simultaneously operating with said first and second terminating time switching means of said second switching network in response to said synchronization means and to said operation of each said first and second space switching means.

4,399,370

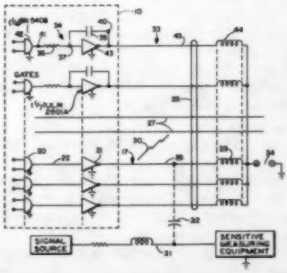
NOISE REDUCTION METHOD AND APPARATUS

Keith J. Bulleyment, North Oaks, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 18, 1982, Ser. No. 339,966

Int. Cl.³ H02B 1/24

U.S. Cl. 307—112 **8 Claims**



1. Means for reducing noise due to switching transients in a control system having a plurality of inverting amplifiers located at a common site to receive individual switching input signals, a like plurality of relays located remotely from said amplifiers for individual energization and de-energization thereby in accordance with said switching signals, and conductors connecting said relays severally to said amplifiers,

said means comprising series circuits associated severally with said amplifiers, each said circuit including a resistor

and a capacitor having first terminals interconnected at a junction point and second, independent terminals,

means connecting the inputs of said amplifiers severally to said junction points,

means connecting the input signals severally to said independent terminals of said resistors,

and means connecting the outputs of said amplifiers severally to said independent terminals of said capacitors.

4,399,371

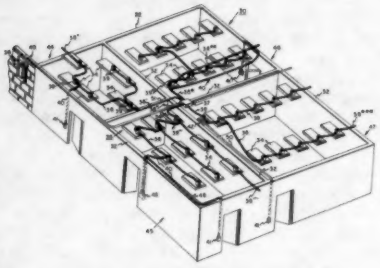
MODULAR WIRING SYSTEMS

Stephen J. Ziff, New York, N.Y.; Richard L. Sieron, Fairfield, and William P. Shine, Monroe, both of Conn., assignors to Dual-Lite, Inc., Newtown, Conn.

Continuation of Ser. No. 929,455, Jul. 31, 1978, abandoned. This application Aug. 28, 1981, Ser. No. 297,512

Int. Cl.³ H02G *3/26;* F21S *7/00*

U.S. Cl. 307—147 **30 Claims**



1. A connector assembly for a modular wiring system comprising:

(A) a first connector having plural terminals of a first configuration for receipt of electrical power from a source of electrical power or from another connector assembly;

(B) a series of conductors, each individually permanently terminating at one end with one of the first connector terminals; and

(C) a multi-face connector (**39**) having at least second, third, fourth, fifth, and sixth connectors, each connector having a separate face with a plurality of recesses formed in each face, each recess of each face substantially coplanar with a recess of each other face, and further wherein:

(1) the second connector ("S" face **88**) has plural terminals of a second configuration unable to mate with the source of electrical power for mating with a lighting fixture receptacle so as to provide at least switched power to the fixture,

(2) the third connector ("U" face **86**) has plural terminals of a second configuration unable to mate with the source of electrical power for mating with a lighting fixture receptacle so as to provide at least unswitched power to the fixture,

(3) the fourth connector ("switch" face **87**) has plural terminals of a second configuration unable to mate with the source of electrical power for mating with a switch or switch assembly for controlling the switched power,

(4) the fifth connector ("M" face **84**) has plural terminals of a second configuration unable to mate with the source of electrical power for mating with the first connector of a second connector assembly for passing power to the second connector assembly,

(5) the sixth connector ("M" or "X" face **85**) has plural terminals of a second configuration unable to mate with the source of electrical power for mating with the first connector of a third connector assembly for passing power to the third connector assembly,

(6) a plurality of bus bars, at least some of the bus bars having a region for permanent connection to one of the conductors, each bus bar forming some of the terminals of the second, third, fourth, fifth and sixth connectors, at least some of the bus bars interlaced in an electrically isolated, non-coplanar arrangement with each other, each of the interlaced bus bars having at least some of its terminals in a non-coplanar arrangement with each other so that the electrical property on the bus bar is presented at different planar recesses for at least some of the second, third, fourth, fifth, and sixth connector faces, and

(7) a housing for forming the second, third, fourth, fifth and sixth connector faces and for placement and orientation of the bus bars therein;

whereby power is only received by the connector assembly through the first connector which is remotely positioned away from the multi-face connector, wherein the multi-face connector distributes and controls power to receptacles, switch or switch assemblies, and connectors, and wherein the second, third, fourth, fifth, and sixth connectors are unable to mate with the source of electrical power.

4,399,372

INTEGRATED CIRCUIT HAVING SPARE PARTS ACTIVATED BY A HIGH-TO-LOW ADJUSTABLE RESISTANCE DEVICE

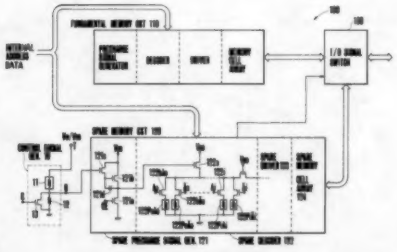
Masafumi Tanimoto, Mitaka; Nobuaki Ieda, Kodaira, and Masato Wada, Tachikawa, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Dec. 8, 1980, Ser. No. 213,846

Claims priority, application Japan, Dec. 14, 1979, 54/163158

Int. Cl.³ H01L *27/04, 29/04;* H03H *5/12;* H03L *3/00*

U.S. Cl. 307—279 **14 Claims**



1. An integrated circuit device comprising: a semiconductor integrated circuit chip including a plurality of circuit elements constituting a multi-functional circuit, and a control signal generating circuit incorporated within said semiconductor integrated circuit chip, said control signal generating circuit comprising: a variable resistance element whose resistance value irreversibly may be changed from a higher resistance value (R_H) to a lower resistance value (R_L); a fixed impedance element connected in series circuit with said variable resistance element, whose resistance value (R_O) is defined to satisfy a relation of $R_L << R_O << R_H$, the respective ends of said series circuit being connected to first and second reference voltage sources, respectively; a conductivity controlled active semiconductor device connected in parallel with said fixed impedance element, the conductive state of said conductivity controlled active semiconductor device being controlled by an external control signal; an output terminal connected to the juncture of said variable resistance element with said fixed impedance element, and to a selected part of said multi-functional circuit; and said variable resistance element being at the higher resistance value (R_H) under normal operating conditions and being switched to the lower resistance value (R_L) from the higher resistance value by impressing upon said variable resistance element a higher voltage than a threshold voltage value greater than a normal operating voltage value im-

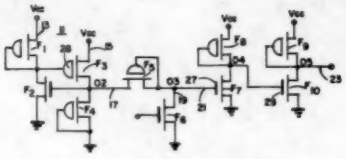
pressed thereon in a normal operating state so that said selected part of said multi-functional circuit may be rendered operable through said output terminal.

4,399,373

FET POWER SUPPLY FOR MOS MEMORIES

Melvin L. Marmet, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 120,239, Feb. 11, 1980, Pat. No. 4,355,247.
This application Oct. 28, 1981, Ser. No. 315,790
Int. Cl.³ H03K 3/01
U.S. Cl. 307—296 R 2 Claims



1. A MOS FET power supply suitable for use in a sense amplifier for providing a substantially constant low voltage variable current source comprising in combination;

a current source FET and a load FET connected in series between a source of voltage and ground;

a second pair of FETs connected in series between said source of voltage and ground;

a feedback path from a junction of the current source FET and the load FET to a control gate for one of the FETs of said second pair; and

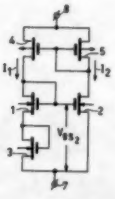
a voltage control path from a junction of the second pair of FETs to a control gate for said current source FET.

4,399,374

CURRENT STABILIZER COMPRISING ENHANCEMENT FIELD-EFFECT TRANSISTORS

Wouter M. Boeke, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 238,294
Claims priority, application Netherlands, Mar. 17, 1980, 8001558
Int. Cl.³ G05F 1/56
U.S. Cl. 307—297 13 Claims



1. A current stabilizer comprising first and second parallel current paths coupled to each other with respect to current via a first and a second current-coupling circuit which define a different relationship of the currents in the first and the second current paths, and with one common value unequal to zero at which the currents in the first and the second current path stabilize themselves, the first current coupling circuit comprising enhancement type field-effect transistors of the first channel conductivity type and the second current coupling circuit comprising a first enhancement type field-effect transistor of a second channel conductivity type opposite to the first conductivity type having a channel included in the first current path and a second enhancement type field effect transistor of said second conductivity type having a channel included in the second current path, the source electrodes of the first and the second field effect transistor being coupled to a first common point, and means for defining a fixed relationship between the gate-source voltage of the first field effect transistor and the gate-source voltage of the second field effect transistor.

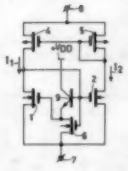
2. A current stabilizer as claimed in claim 1, wherein said voltage defining means comprise a connection between the gate electrodes of the first and the second transistor and at least a third enhancement type field-effect transistor of the second conductivity type having a gate electrode connected to its drain electrode and a channel included between the source electrode of the first transistor and the first common point.

4,399,375

CURRENT STABILIZER COMPRISING ENHANCEMENT FIELD-EFFECT TRANSISTORS

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 238,295
Claims priority, application Netherlands, Mar. 17, 1980, 8001560
Int. Cl.³ G05F 1/56
U.S. Cl. 307—297 8 Claims



1. A current stabiliser comprising first and second parallel current paths current-coupled to each other via first and second current coupling circuits which define a different relationship between the currents in the first and the second current paths and with a common value unequal to zero at which the currents in the first and second path stabilize themselves, the first current coupling circuit comprising enhancement type field-effect transistors of a first channel conductivity type and the second current coupling circuit comprising a first enhancement field-effect transistor of a second channel conductivity type opposite to the first one and having a channel included in the first current path and a second enhancement field-effect transistor of said second conductivity type and having a channel included in the second current path, of which first and second field-effect transistors the source electrodes are coupled to a first common terminal, and means for defining a substantially constant difference between the gate-source voltage of the first field-effect transistor and the gate-source voltage of the second field-effect transistor.

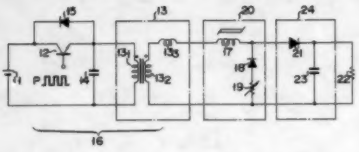
2. A current stabiliser as claimed in claim 1, characterized in that said voltage defining means comprise a bipolar semiconductor junction.

3. A current stabiliser as claimed in claim 2, characterized in that said bipolar semiconductor junction comprises the base-emitter junction of a bipolar transistor having a base electrode connected to the gate electrode of the second field-effect transistor and whose emitter electrode is connected to the gate electrode of the first field-effect transistor and to a bias-current source, the gate electrode of the second transistor being coupled to the drain electrode of the first transistor.

4,399,376
HIGH FREQUENCY SWITCHING CIRCUIT

Toshihiro Onodera, Kunitachi; Koichiro Inomata, Yokohama; Michio Hasegawa, Machida; Yoshio Takamura; Seiji Kajiwara, both of Yokohama, and Shoichi Higo, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 16, 1982, Ser. No. 349,093
Claims priority, application Japan, Feb. 17, 1981, 56-21937
Int. Cl.³ H03K 3/49, 17/60, 19/16
U.S. Cl. 307—415 5 Claims

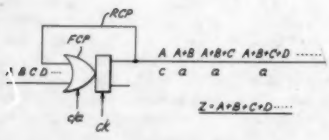


1. A high frequency switching circuit comprising:
a single-ended switching circuit including a transformer having a primary winding and a secondary side circuit, a switching element circuit connected between the primary winding of said transformer and a DC power supply and a resonance capacitor connected in parallel with said primary winding;
a rectifying/smoothing circuit including a filtering capacitor connected in parallel with a rectifying element and a load; and
a magnetic amplifier connected between said secondary side circuit of said transformer and said rectifying/smoothing circuit.

4,399,377
SELECTIVELY OPERABLE BIT-SERIAL LOGIC CIRCUIT

Edwin V. Jones, Colchester, England, assignor to National Research Development Corporation, London, England

Filed Jan. 22, 1980, Ser. No. 114,320
Claims priority, application United Kingdom, Jan. 23, 1979, 7902358
Int. Cl.³ H03K 19/20, 19/003, 19/086, 19/173
U.S. Cl. 307—465 16 Claims

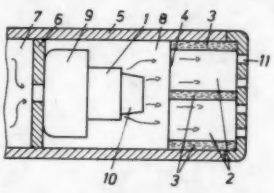


1. A logic circuit for performing at least one selected logical action on supplied serial data bits to provide a data output signal, said circuit including:
a clock-controlled selectable-mode gate circuit means, responsive to a mode control signal applied thereto and having at least a first input terminal respective of signals indicative of said serial data bits, and at least one output terminal, for providing a forward circuit path from said first input terminal to said output terminal selectively operable in at least a copy mode and a logical action mode;
said copy mode comprising, providing the instantaneous supplied serial data bit at said first input terminal unchanged at said output terminal;
said logical action mode comprising generating a signal at said output terminal indicative of the instantaneous serial input data bit in predetermined Boolean logic combination with at least one previously occurring data bit.

4,399,378
FILTER FOR COOLING AIR STREAM OF ELECTRIC COMMUTATOR MOTOR FOR HOUSEHOLD DEVICE

Heinz-Gerhard Krumm, Ennepetal, and Horst Neugart, Wuppertal, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,738
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107879
Int. Cl.³ H02K 9/26
U.S. Cl. 310—56 13 Claims

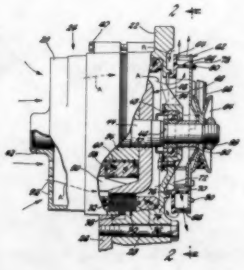


1. A filter for a cooling air stream of an electric commutator motor for a household device, comprising means forming a passage into which a cooling air stream flows in a predetermined direction after passing an electric commutator motor; and a filtering member composed of an electrostatically charged material which coats at least a portion of said passage, said electrostatically charged material having a section which extends substantially transverse to said direction, so that the cooling air flow impinges against said section.

4,399,379
AIR COOLED MACHINE AND COOLING FAN

Stephen W. Marks; Gary D. Wooten, and Ronald N. Gray, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1980, Ser. No. 218,164
Int. Cl.³ H02K 9/06
U.S. Cl. 310—62 4 Claims



1. The combination of a machine having an air cooled rotor operatively mounted within the housing thereof and a rotatable fan spaced closely adjacent to one end of said housing to draw cooling air therethrough, said fan having an air intake and an air discharge, a rotatable shaft extending into said housing for driving said rotor, said housing having air inlet and outlet openings in opposite ends thereof, said fan being mounted on said shaft exteriorly of said housing and having a plurality of blades extending therefrom for drawing air

through said housing by way of said inlet and outlet openings, and first and second axially extending ring means respectively extending from said housing and said fan into an overlapping relationship with one another with continuous clearance to permit relative rotation and to provide a restricted labyrinth air seal therebetween so that air discharged from said fan will be blocked from recirculation into the intake of said fan thereby permitting the fan to pump increased quantities of air through said housing for increased cooling efficiency.

4,399,380

AIR COOLED WIPER MOTOR

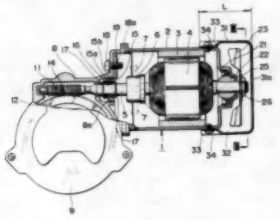
Koki Hirano, Fujisawa, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 11, 1981, Ser. No. 291,909

Claims priority, application Japan, Aug. 29, 1980, 55/121824[U]; Aug. 29, 1980, 55/121825[U]

Int. Cl.³ H02K *9/06*

U.S. Cl. 310—62 **6 Claims**



1. An air-cooled wiper motor comprising a motor yoke of the totally enclosed without any ventilation openings, an armature body of a revolving type provided therein, a rotatable armature shaft secured to the armature body, a reduction gear mechanism provided at one end of the armature shaft and connected to a vehicle wiper blade, a self-cooling fan provided to the other projected end of the armature fan provided to the other projected end of the armature shaft, and a fan cover provded around the fan for forming a pair of ventilation ducts between the cover and two diametrically opposed outer surface portions of the yoke for directing cooling air over the outer surface of the yoke parallel to said armature shaft, said ducts each having a limited width not exceeding the outer diameter of the yoke.

4,399,381

HOMOPOLAR DYNAMOELECTRIC MACHINE

Jean-Pierre Chabrerie, Gif Chevry, France, assignor to Agence Nationale de Valorisation de la Recherche ANVAR, Neuilly-sur-Seine, France

Continuation of Ser. No. 72,794, Sep. 5, 1979, abandoned. This application Aug. 21, 1981, Ser. No. 295,194

Claims priority, application France, Sep. 7, 1978, 78 25728

Int. Cl.³ H02K *31/00*

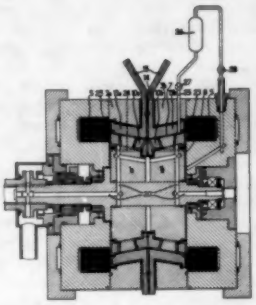
U.S. Cl. 310—178 **7 Claims**

1. A homopolar machine, comprising, a stator and a rotor with magnetic portions and a generally cylindrical clearance space between the stator and rotor, means for producing a magnetic flux which moves through a magnetic circuit which extends across said clearance space and through said magnetic portions of the stator and rotor, nonmagnetic electrically conductive elements which extend along the stator and rotor and are electrically insulated from said magnetic portions of the stator and rotor,

said conductive elements on said rotor including axially spaced continuous rings and a first set of radially spaced bars, said bars being located in notches on the rotor, said rotor having magnetic portions which project between adjacent said bars and confront said clearance space to minimize the thickness of the clearance space,

said conductive elements on said sensor including axially spaced continuous rings and a second set of radially spaced bars,

one said set of bars being arranged parallel to the axis of the machine, and the other said set of bars being inclined to



the axis of the machine, said other set of bars being formed of two bar sections which are of equal cross section and are equally inclined in opposite directions relative to the axis of the machine,

electrical contact means electrically connecting the conductive elements of the rotor to the conductive elements of the stator to form an electrically conductive loop which has no magnetic element therewithin.

4,399,382

ELECTRICAL MACHINE

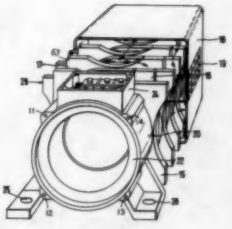
Wolfgang Volkrodt, No. 8, Waldsiedlung, 8740 Bad Neustadt, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,452

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026892

Int. Cl.³ H02K *1/00*

U.S. Cl. 310—216 **7 Claims**



1. An electrical machine comprising a stator having a cylindrical cavity extending therethrough; bearing means at opposite ends of said stator; a rotor in said cavity and mounted for rotation at opposite ends thereof in said bearing means; said stator comprising a plurality of stator plates having the same asymmetrical configuration and arranged in stacked relationship, each stator plate having a circular aperture therein of predetermined diameter, four secondary apertures arranged in a square configuration about said circular aperture, said secondary apertures being a predetermined distance from the perimeter of said circular aperture and the axes of said square configuration of said secondary apertures and of said circular aperture coinciding, a base edge spaced from one side of said circular aperture and from a pair of said secondary apertures,

parallel side edges extending from opposite ends of said base edge, the distance of said side edges from each other being such that said side edges are a predetermined distance from the respective opposite sides of said circular aperture, and a top edge extending between said parallel side edges at the side of said circular aperture opposite said base edge, at least a major central portion of said top edge having a convex semicircular configuration concentric with and spaced a predetermined distance from the side of said circular aperture, said base edge having a central concave semicircular configuration complementary to said convex semicircular configuration of said top edge opposite said base edge and being spaced a greater distance from said one side of said circular aperture than said side and top edges; said stator plates of said stator being arranged in said stack with their circular apertures aligned to form said cylindrical cavity and with said stator plates arranged with their base edge sides offset from each other by 90° and multiples thereof about the axis of said cylindrical cavity such that said secondary apertures of said stator plates are aligned to form four axial channels in said stator equally spaced about said cylindrical cavity; and means securing said bearing means and stator with said stator plates in said stacked relationship whereby the portions of said stator plates adjacent said base edge project radially about said stator and are spaced from each other to provide tangential cooling ribs.

4,399,383

GASOLINE RESISTANT COMMUTATOR

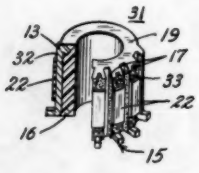
Akira Kamiyama, Kiryu, Japan, assignor to Mitsubá Electric Mfg. Co., Ltd., Gumma, Japan

Division of Ser. No. 969,277, Dec. 13, 1978, Pat. No. 4,283,841. This application Feb. 17, 1981, Ser. No. 234,938

Claims priority, application Japan, Jan. 26, 1978, 53-6680; Jul. 20, 1978, 53-100447

Int. Cl.³ H02K *13/04*

U.S. Cl. 310—233 **14 Claims**



1. A commutator submergeable in gasoline during use and comprising:

a cylinder of an insulating material;

a plurality of copper segments fixed to the peripheral surface of said cylinder extending in the direction parallel with the center axis of said cylinder and arranged spaced apart from one another along the peripheral surface of said cylinder, each of said segments including a riser-forming projection which extends outwardly of said cylinder and a claw-forming projection which is at least partially embedded in said cylinder;

a brush-contact sheet of a first gasoline-resistant material provided on each of said segments; and

a cover layer of a second gasoline-resistant material provided to cover the exposed surface of each of said segments where not covered by said brush-contact sheet.

4,399,384

SEALED-TYPE D.C. ELECTRIC MOTOR HAVING REDUCED DIAMETRICAL BULK

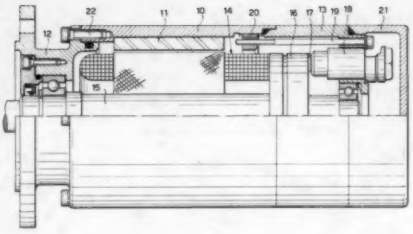
Guido Lucherini, Via Caboto 3, Milano, Italy

Filed Sep. 10, 1980, Ser. No. 186,206

Claims priority, application Italy, Oct. 4, 1979, 22763[U]/79

Int. Cl.³ H01R *39/44*

U.S. Cl. 310—241 **5 Claims**



1. A D.C. electric motor comprising a stator yoke, a first end shield secured to one end of said yoke, a second end shield secured to the opposite end of said yoke, thin permanent stator magnets fixedly carried to said yoke, an armature rotatably journalled in said end shields in cooperating relation to said stator magnets, said armature having a collector at one end thereof facing an adjacent one of said end shields in axially opposed relation, brushes carried by said one end shield for axial movement relative to said one shield to engage said collector, and mounting means mounting said one end shield for rotation about the axis of said armature for rotationally positioning said brushes relative to said stator magnets, seid mounting means including a mounting ring threadedly rotationally secured to the interior of said yoke adjacent longitudinal ends of said stator magnets, and longitudinal tie members extending between said one end shield and said ring, and a screw threaded connection between the interior of said yoke and said ring whereby said ring is interlocked with said yoke against longitudinal displacement relative to said yoke when threadably rotationally positioned.

4,399,385

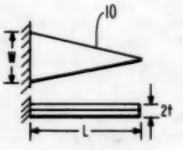
ROTATIVE MOTOR USING A TRIANGULAR PIEZOELECTRIC ELEMENT

Susumu Osaka, and Minoru Toda, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,976

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—328 **1 Claim**



1. In combination,

a rotatable member,

first and second triangular piezoelectric elements secured at one end to a support at an optional angle to one another, the opposite ends of said elements being free to vibrate,

an elastic member connected between said free ends with the central point of said elastic member in frictional contact with the surface of said rotatable member, and

means for exciting said elements to cause by a phase difference of the vibration at the respective free ends of said

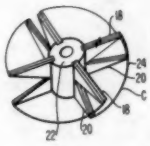
elements the central point of said elastic member to have a closed loop path to rotate said rotatable member in a direction determined by said phase difference.

4,399,386

ROTATIVE MOTOR USING PLURAL ARRAYS OF PIEZOELECTRIC ELEMENTS

Susumu Osaka, and Minoru Toda, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,790
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—328 **1 Claim**



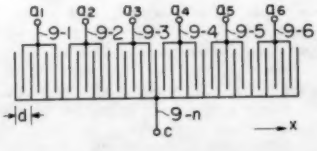
1. In combination,
a rotatable member,
a plurality of piezoelectric elements radially secured at one end to a support in a two-staged shape comprising upper and lower arrays of said elements, the opposite ends of said elements being free to vibrate,
a plurality of elastic members each connecting the free end of each one of said upper elements with the free end of a different one of said lower elements, with a central point of each elastic member in frictional contact with the surface of said rotatable member, and
means for exciting each pair of said inter-connected elements to cause by a phase difference of the vibration at the respective free ends of said inter-connected elements the central point of said respective elastic member to have a closed loop path to rotate said rotatable member in a direction determined by said phase difference.

4,399,387

ULTRASONIC WAVE TRANSDUCER

Toda Kohji, Yokosuka, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 953,374, Oct. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,291, Oct. 21, 1977, Pat. No. 4,173,009. This application Dec. 12, 1980, Ser. No. 215,902
Claims priority, application Japan, Nov. 21, 1977, 52-138981; Nov. 21, 1977, 52-138982; Dec. 6, 1977, 52-145636; Dec. 6, 1977, 52-145637; Dec. 21, 1977, 52-152966
The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—334 **6 Claims**



1. An ultrasonic wave transducer comprising: a piezoelectric substrate having a planar surface and at least one interdigital electrode group arranged on said surface of said piezoelectric substrate, each of said groups having a plurality of interdigital electrodes, each electrode of which has a plurality of longitudinally-extending fingers, said plurality of electrodes being arranged in a row extending in the longitudinal direction of said fingers of each interdigital electrode, and said electrodes having electrical terminals for applying an alternating voltage thereto with a predetermined phase difference between each of said interdigital electrodes, so that when said transducer is disposed so that said interdigital electrodes thereof contact with a liquid, an ultrasonic wave is generated from said electrodes into the liquid, and wherein the period between said fingers of said electrodes satisfies

$$r_n^2 = k_1 n\lambda_f L + k_2 n^2 \lambda_f^2$$

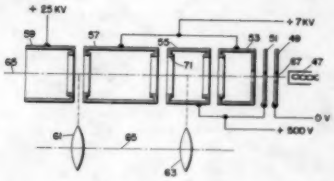
where, as defined with respect to cartesian coordinates, r_n is the abscissa length between the n'th finger of the electrode and the focal point, λ_f is the wavelength of the sound wave in a liquid, L is the ordinate length between the n'th electrode and the focal point, and k_1 and k_2 are constants.

4,399,388

PICTURE TUBE WITH AN ELECTRON GUN HAVING NON-CIRCULAR APERTURE

Eizaburo Hamano, Kumagaya; Shinpei Koshigoe, and Eiji Kamohara, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 16, 1980, Ser. No. 197,643
Int. Cl.³ H01J *29/46, 29/50, 29/56*
U.S. Cl. 313—414 **10 Claims**

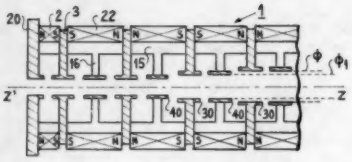


1. A picture tube comprising:
an envelope containing a panel;
a phosphor screen on the inner wall of said panel;
an electron gun for generating an electron beam having a substantially circular cross-sectional shape for scanning said phosphor screen in both vertical and horizontal directions, said electron gun comprising a triode section emitting said electron beam, which section has at least one electrode having a non-circular aperture containing major and minor axes of symmetry, said major axis being positioned substantially parallel to said horizontal direction and a focusing section for focusing said electron beam, which has a plurality of electrodes placed along a path of said electron beam, and;
said focusing section having a means for forming an electrostatic focusing lens having a vertical focal length and a horizontal focal length, said vertical focal length more elongated than said horizontal focal length,
said focusing section having at least two electrodes facing each other for forming an electrostatic focusing lens along the path of said electron beam, one of said electrodes having a non-circular aperture containing major and minor axes of symmetry, said major axis of said one electrode within said focusing section being positioned substantially parallel to said vertical direction, and
a voltage means for applying a lower voltage to said one electrode within said focusing section than the voltage applied to said other facing electrode in said focusing section.

4,399,389
TRAVELLING WAVE TUBE WITH COUPLED CAVITIES AND FOCUSING BY ALTERNATING PERMANENT MAGNETS AND AMPLIFYING SYSTEM COMPRISING SUCH A TUBE

Georges Fleury, and Francis Payen, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 27, 1981, Ser. No. 248,317
Claims priority, application France, Apr. 1, 1980, 80 07294
Int. Cl.³ H01J 25/34
U.S. Cl. 315—3.5 5 Claims



1. A travelling wave tube comprising a cathode system producing an electron beam propagating along an axis and a collector by which the beam is intercepted, and, arranged around said axis between the cathode system and the collector, a delay line formed by successive re-entrant resonator cavities centered on the axis and coupled to one another, said tube being provided with a system for focusing the electron beam having alternating permanent magnets and constituted by magnetized collars, surrounding the outer wall of the cavities, and pole pieces gripped between the cavities and alternating therewith, at a rate of one pole piece every two cavities, said pole pieces being terminated on the side of the axis by a collar centered on said axis, the wall common to two successive cavities being in a material having a thermal conductivity higher than the pole pieces and being itself terminated on the same side by a similar collar made from a magnetic material, these collars forming the re-entrant part of the cavities, whereby transversely with respect to the axis the collars limit the space in which the beam is propagated, wherein the diameter of these collars increases in the beam propagation direction, particularly in the final part of the line, said increase taking place in stages, every other collar, the collar of one pole piece and that of the common wall which follows it having the same diameter.

4,399,390
BUILT-IN STARTER TYPE FLUORESCENT LAMP SOCKET

Hiroshi Oshita; Hiromi Adachi, and Kazunari Inoue, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

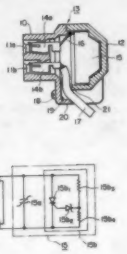
Filed Dec. 12, 1980, Ser. No. 215,769
Claims priority, application Japan, Dec. 18, 1979, 54-164585
Int. Cl.³ H05B 41/04; H01R 33/08
U.S. Cl. 315—101 5 Claims

1. A built-in starter type fluorescent lamp socket, comprising:

a socket body including a casing and a cover portion;

a pair of starter contacts and a pair of power source contacts embedded in said casing; and

power leads coupled to said power contacts at the interior of said socket body and extending to the exterior thereof,

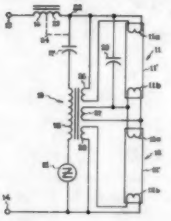


said casing and cover portion clamping said power leads therebetween.

4,399,391
CIRCUIT FOR STARTING AND OPERATING FLUORESCENT LAMPS

Edward E. Hammer, Mayfield Village; Eugene Lemmers, Cleveland Heights, both of Ohio, and Dail L. Swanson, Danville, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,338
Int. Cl.³ H05B 41/14, 41/36
U.S. Cl. 315—244 7 Claims

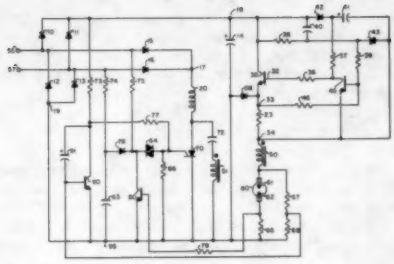


1. A circuit for starting and operating one or more fluorescent lamps from an a-c sine wave electrical power source of given frequency, comprising reactive ballast means connected in series with said power source and said lamps and having a non-linear characteristic for producing a plurality of harmonics of said given frequency, a cathode heating transformer comprising a primary wnding and secondary windings for connection to the cathodes of said lamps, a capacitor connected in series with said primary winding, means connecting one or both of said series-connected capacitor and primary winding across said lamps, the combined reactance of said capacitor and said primary winding being at least partially in resonance, in cooperation with inductance of said reactive ballast means, over a frequency range simultaneously encompassing a plurality of said harmonics of the given power source frequency, and a switch interposed in series with said series-connected capacitor and primary winding, said switch being closed during starting of said lamps to cause said resonance and to cause heating of said cathodes, and said switch being open after starting of and during operation of said lamps.

4,399,392
ARC LAMP POWER SUPPLY

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 26, 1982, Ser. No. 352,675
Int. Cl.³ G05F 1/00; H05B 39/00
U.S. Cl. 315—308 7 Claims

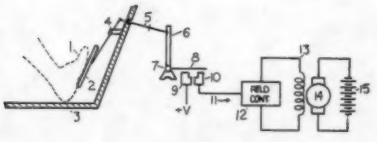


1. The combination of an electric arc lamp, incandescent filament, and power supply, said power supply comprised of:
means for sensing arc lamp voltage;
means for sensing arc lamp current;
means for providing current to said incandescent filament when arc lamp voltage is high and arc lamp current is low, in reference to predetermined values,
for providing current to said incandescent filament when arc lamp voltage is low and arc lamp current is high, and for not providing current to said incandescent filament when arc lamp voltage is high and arc lamp current is high;
wherein said means for providing current to said incandescent filament also provides starting voltage pulses to ignite said arc lamp only when arc lamp voltage is high and arc lamp current is low.

4,399,393
ACCELERATOR CONTROL FOR ELECTRIC VEHICLES

John Santini, Centerreach, N.Y., assignor to TII Electronics, Inc., Copiague, N.Y.

Filed Dec. 3, 1980, Ser. No. 212,600
Int. Cl.³ H02P 1/18
U.S. Cl. 318—313 5 Claims

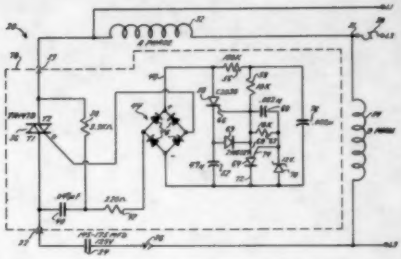


1. A photoelectric controller comprising:
(a) movable control input means having non-mirrorlike light reflective means;
(b) light source means for shining light at the reflective means;
(c) detector means for detecting the amount of light from the light source reflecting from the reflective means, producing an output having a magnitude responsive to the amount of light detected;
(d) the detector means producing an output function relating the motion of the control input means to the magnitude of the output of the detector means;
(e) the output function being proportional to the geometric arrangement and movement of the reflective means of the control input means, relative to the light source and detector means.

4,399,394
ELECTRONIC MOTOR START SWITCH

Gray C. Ballman, 30 Portland Dr., Frontenac, Mo. 63131

Filed Nov. 2, 1981, Ser. No. 317,150
Int. Cl.³ H02P 1/44
U.S. Cl. 318—786 9 Claims



1. An electronic switching circuit to automatically disconnect a first winding of a two winding electric motor from an applied voltage after a predetermined time delay, said switching circuit having means to reset itself to provide timed disconnection of either winding upon re-connection of said motor, the timed disconnection means including a timing capacitor in circuit with an electronic switch, the reset means having means to operate said electronic switch and reset the charge level of said timing capacitor, said reset means including a second electronic switch in circuit with said first electronic switch, means to trigger said second electronic switch in response to the charge level of said timing capacitor, and a second capacitor in circuit with said second electronic switch to latch it on through the low voltage portion of a full wave rectified waveform.

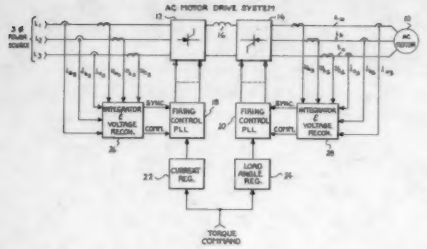
4,399,395
LINE-TO-LINE VOLTAGE RECONSTRUCTION FOR SYNCHRONIZING THYRISTOR POWER CONVERTER

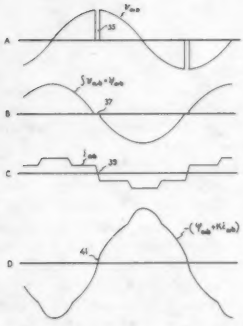
Paul M. Espelage, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Sep. 8, 1981, Ser. No. 300,200
Int. Cl.³ H02P 7/62
U.S. Cl. 318—803 30 Claims

1. A method of generating a control signal for controlling a synchronization and commutation of thyristor firing circuitry included in a phase-locked electrical power converter coupled to a polyphase AC power line, comprising the steps of:
(a) deriving at least one voltage signal representing the line-to-line voltage on said AC power line;
(b) deriving at least one delta current signal indicative of the current in a phase of said AC power line;
(c) generating a pseudo flux signal waveform from said voltage signal;
(d) providing an electrical analog of the commutation inductance of said power converter and generating a product signal corresponding to the product of said delta current signal and said analog of the commutation inductance;
(e) combining said pseudo flux signal waveform with said product signal to provide a composite signal therefrom;

(f) thereafter generating said control signal from said composite signal; and





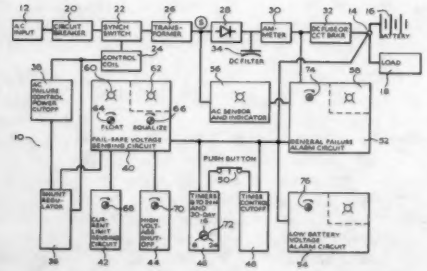
(g) applying said control signal to said thyristor firing circuitry of said power converter.

4,399,396

TWO LEVEL CONSTANT VOLTAGE FLOAT CHARGE RECTIFIER AND BATTERY SURVEILLANCE APPARATUS

Alfred M. Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Filed Aug. 3, 1981, Ser. No. 289,278
Int. Cl.³ H02J 7/04
U.S. Cl. 320—43 **16 Claims**



1. A current limiting, two-level constant voltage float charge rectifier and battery surveillance apparatus having full-time battery and circuit operation surveillance, and adapted for connection at its input to a source of alternating current electrical energy and at its output to an electrical load in parallel with a storage battery, for supplying electrical energy to said load when said source of electrical energy is connected and for constant voltage float charging said battery at a first voltage level and for battery re-charging and equalization at a second voltage level higher than said first voltage level; comprising:

controllable synchronous switch means having a control coil, for controlling the rate of electrical energy input to an electrical load in parallel with a storage battery to which said apparatus is connected, and for constant voltage float charging said battery and constant voltage electrical energy input to said load at a first voltage level, except when otherwise under control of a first, adjustable timing circuit;

said first, adjustable timing circuit being adapted for setting a predetermined period of time and for controlling a battery re-charging and equalization program, including a constant voltage charging at a second voltage level higher than said first voltage level, during said predetermined period of time; and for automatically returning to said constant voltage float charging and electrical energy supply program at the end of said predetermined period of time;

adjustable fail-safe voltage sensing means;

regulated fail-safe current limit sensing means;

timer control cut-off means; and,

general failure alarm circuit means for detecting at least failure of said apparatus or of the source of alternating current electrical energy to said apparatus, and for generating a signal upon such failure;

said regulated fail-safe current limit sensing means including a zener diode in series with a diode and a potentiometer;

said timer control cut-off means being such as to initiate a battery re-charging and equalization program so as to equalize the operating and sensed parameters of said apparatus following a predetermined delay after disconnection of said apparatus from said source of alternating current electrical energy, or failure thereof; and,

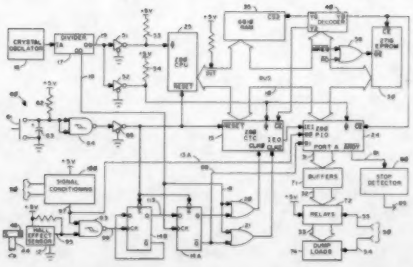
said adjustable fail-safe voltage sensing means driving shunt regulator means in parallel to said control coil; said shunt regulator means driving said control coil of said controllable synchronous switch means by controlling the operating period of said control coil.

4,399,397

ELECTRONIC PHASE SHIFT AND SPEED GOVERNOR

Robert S. Kleinschmidt, Jr., Pittsfield, Me., assignor to R. Stevens Kleinschmidt, Pittsfield, Me., a part interest

Filed Apr. 17, 1981, Ser. No. 255,153
Int. Cl.³ H02P 9/00, 9/14
U.S. Cl. 322—8 **15 Claims**



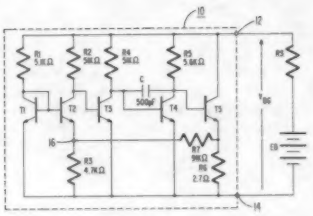
1. An electronic governor for controlling and stabilizing the electrical power output delivered to an output circuit by an AC alternator having a rotating shaft driven by a source, comprising sensing and detecting means for sensing and detecting a phase shift of the electrical power output relative to the

rotating shaft corresponding to changes in load at the output circuit and for generating corresponding phase shift signals, a plurality of dump load means, and phase shift governing means comprising switching means operatively coupled for switching said dump load means into and out of the output circuit in response to said phase shift signals.

4,399,398
VOLTAGE REFERENCE CIRCUIT WITH FEEDBACK CIRCUIT

Harold A. Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,194
Int. Cl.³ G05F *1/613, 3/20*
U.S. Cl. 323—226 **7 Claims**



1. A circuit for developing a predetermined value of reference potential between first and second terminals comprising:

a pair of transistors;

first and second resistances;

means connecting said pair of transistors and said first and second resistances in circuit between said first and second terminals for operating said pair of transistors at different emitter current densities to develop a difference between their respective base-emitter potentials, wherein said first resistance is connected for receiving said difference potential and said second resistance is connected for receiving said difference potential increased in proportion to the resistances of said first and second resistances, and wherein at least the potential across said second resistance is summed with the conduction potential of at least one semiconductor junction to develop said reference potential between said first and second terminals;

regulating means, coupled between said first and second terminals to conduct a controlled current therebetween, for maintaining said reference potential at said predetermined value by increasing and decreasing said controlled current flowing between said first and second terminals in response to said reference potential departing from said predetermined value in increasing and decreasing senses, respectively, wherein said regulating means provides a degenerative (negative) feedback connection; and

control means for maintaining said reference potential at said predetermined value by controlling the potential across said second resistance in response to said controlled current flowing through said regulating means, wherein said control means provides a regenerative (positive) feedback connection.

4,399,399
PRECISION CURRENT SOURCE

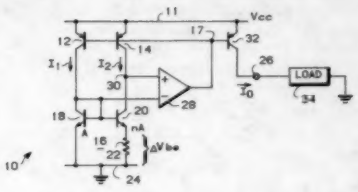
Eric D. Joseph, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1981, Ser. No. 333,211
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—315 **5 Claims**

4. A monolithic integrated precision current source circuit for providing a current at an output thereof the magnitude of which is independent to variations in the magnitude of an operating potential supplied thereto, comprising:

first and second transistors each having first, second and control electrodes, said first electrode being adapted to receive the operating potential, said respective bases being coupled to a circuit node;

at least one output transistor having first, second and control electrodes, said first electrode being adapted to receive said operating potential, said second electrode being coupled to the output of the current source, said base electrode being coupled to said circuit node;



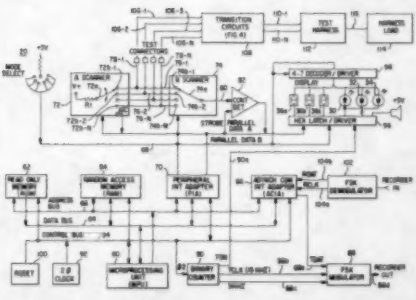
feedback circuit means coupled between said second electrodes of said first and second transistors and said circuit node for maintaining said second electrodes at substantially equal potentials; and

a current mirror circuit coupled with said feedback circuit means to said second electrodes of said first and second transistors for producing a difference voltage and a current that is substantially independent of the voltage potentials appearing at said second electrodes of said first and second transistors, the output current of the current source being proportional to said current.

4,399,400
APPARATUS FOR TESTING MULTICONDUCTOR CABLES AND HAVING TRANSITION CIRCUIT MEANS FOR EXTENDING ITS CAPABILITY

Kenneth N. Rockwell, Yorba Linda, and Harold Minuskin, Tustin, both of Calif., assignors to Cablescan, Inc., Orange, Calif.

Filed Oct. 30, 1980, Ser. No. 202,375
Int. Cl.³ G01R *31/02, 19/00, 15/12*
U.S. Cl. 324—51 **8 Claims**



1. Apparatus for evaluation of electrical characteristics of a multiconductor cable having input and output end points and of electrical components connected to said output end points, said apparatus comprising:

(a) storage means for storage of information indicative of circuit conditions required to exist between such cable input end points;

(b) first scanning means for generating a test signal and applying same successively to said cable input end points;

(c) second scanning means for communication successively with said cable input end points for receipt of said test signal therefrom;

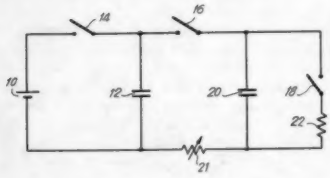
(d) detection means connected to said second scanning means and responsive to such received test signal for initiating comparison of circuit conditions existing between said cable input end points and such stored information with respect thereto; and

(e) transition circuit means for connection to said first and second scanning means and those of said cable input end points having an electrical component connected to corresponding output points thereof, said transition circuit means being responsive to said test signal to determine if said component has a predetermined electrical characteristic and, upon such determination, to return said test signal to said second scanning means.

4,399,401
METHOD FOR DESTRUCTIVE TESTING OF DIELECTRIC CERAMIC CAPACITORS

Solomon Levinson, Forest Hills, N.Y., and William Reilly, Centre Hall, Pa., assignors to Centre Engineering, Inc., State College, Pa.

Filed Aug. 26, 1981, Ser. No. 296,452
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **6 Claims**



1. A method of testing ceramic dielectric capacitors comprising the steps of

a. applying a voltage of 2.5 times the rated voltage of said capacitor to said capacitor through a variable resistance,

b. varying the value of said resistance from 0 ohms to a nominally low ohmic value,

c. testing a plurality of groups of similar capacitors at each resistance value and determining the failure rate at each of said resistance values,

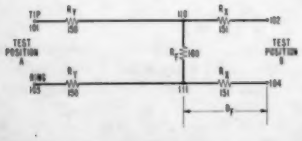
d. setting a test resistance value equal to that at which the failure rate is substantially level, and

e. applying a voltage 2.5 times the rated voltage for each further capacitor being tested through a resistance having a value determined in accordance with step d.

4,399,402
RESISTIVE FAULT SECTIONALIZATION

James A. Pelletier, Dover, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1981, Ser. No. 298,074
Int. Cl.³ G01R *31/08*; H04B *3/46*
U.S. Cl. 324—52 **7 Claims**



1. A method for testing a cable pair (TIP,RING) to locate a shunt resistance fault (R_F) between first (A) and second (B) test positions by determining the conductor (TIP or RING) resistance (R_X) between said fault and said second test position, said method

CHARACTERIZED BY THE STEPS OF

measuring the DC resistance (A_1) of said pair at said first test position with said pair open-circuited at said second test position,

measuring the DC resistance (A_2) of said pair at said second test position with said pair open-circuited at said first test position,

measuring the DC resistance (A_3) of said pair at said second test position with said pair short-circuited at said first test position, and

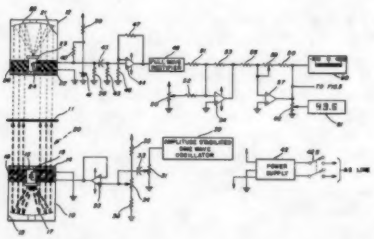
determining the value of said resistance (R_X) from the expression

$$R_X^2 - A_2 R_X + (A_1/4)(A_3 - A_2) + (A_2/2)^2 = 0.$$

4,399,403
MICROWAVE MOISTURE MEASURING, INDICATING AND CONTROL APPARATUS

Charles F. Strandberg, Jr., High Point, and Robert C. Strandberg, Greensboro, both of N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed Sep. 22, 1981, Ser. No. 304,580
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58.5 A **9 Claims**



1. A microwave moisture measuring and indicating apparatus for measuring the moisture content of moisture absorping material in an inspection area comprising a microwave transmitter means located to one side of the inspection area for transmitting a microwave monitoring beam of a selected frequency and energy level toward and through the material at the inspection area, a microwave receiver means located to the opposite side of the inspection area for receiving microwaves transmitted through the inspection area and the material located therein, said microwave transmitter means including a concave substantially parabolic reflector facing toward the inspection area and a microwave oscillator means providing a localized source of microwave energy spaced toward the inspection area from said parabolic reflector and located substantially at the focal point of the latter for directing microwave energy toward said parabolic reflector which is thereupon reflected toward the inspection area as a microwave monitoring beam of much larger transverse area than said source, said microwave receiver means including a substantially parabolic receiver reflector similar in size and shape to the reflector of said transmitter means located in the path of said monitoring beam to receive microwave energy after passage through said inspection area and including a microwave detector means located toward said inspection area from said parabolic receiver reflector at substantially the focal point thereof for detecting the microwave energy impinging on said parabolic receiver reflector and reflected thereby to said detector means and producing a detector output signal, signal processing means for amplifying and processing said detector output signal for producing a D-C moisture indicating signal

which is directly proportional to the moisture content of the material in said inspection area through which the microwave energy of said beam passed, indicator means responsive to said D-C moisture indicating signal for indicating a quantity which is a function of the moisture content of said material, and each of said microwave transmitter means and microwave receiver means having a layer of microwave absorping material between the respective parabolic reflectors and said inspection zone in the path of the microwave energy forming said monitoring beam.

4,399,404

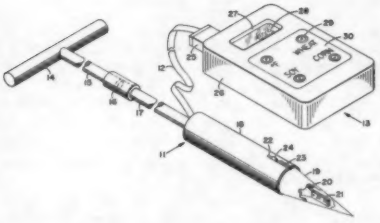
MOISTURE TESTER WITH PROBE

Roy E. Resh, 2729 Sycamore Ter., Bettendorf, Iowa 52732

Filed Feb. 23, 1981, Ser. No. 237,368

Int. Cl.³ G01R *27/26*; G01N *5/02*

U.S. Cl. 324—61 R **5 Claims**



1. An electronic tester having a detecting circuit and probe, said probe to be inserted in fluid materials to determine permittivities thereof by capacitive measurements, said probe comprising:

a length of conductive tubing having an end to be inserted into said fluid materials,

a thin substrate of a printed circuit board, an end of said substrate being disposed diametrically within said end of said tubing and extending axially outward beyond said end of said tubing, a first thin layer of conductive material on said substrate, a maximum transverse dimension of said first thin layer of conductive material being substantial but being less than that of said tubing, said thin layer of conductive material and said end of said conductive tubing forming a sensing capacitor having capacitances determined by different permittivities of materials into which said probe is inserted, and

said detecting circuit having an input circuit connected to said sensing capacitor and an output providing signals having intensities according to respective permittivities of said materials into which said probe is inserted.

4,399,405

TEST FACILITY

Klaus Welzhofer, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 215,086

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951929

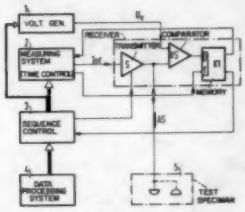
Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 AT **21 Claims**

1. A test facility for an automatic test system for function testing of integrated circuits of different technologies, each test specimen having an input and an output, comprising:

a test pin for connection to both the input and the output of a test specimen;

a transmitter including a constant current source including an input for receiving an input signal at a TTL level referred to zero volts and including an output, an output stage including an input connected to said output of said constant current source, including a dynamically variable constant current load which adapts said output stage to emit or receive current and including an output connected to said test pin and to said load, a programming circuit including a pair or programming inputs for receiving signal levels defining respective circuit technologies and including a plurality of resistors for connection to said constant current source and including switch means connected to said programming inputs and to said plurality of resistors and selectively operable in response to the applied signal levels to selectively connect said resistors to said constant current source to set the output level thereof



to drive said output stage in accordance with the technology defined by the applied signal levels;

a receiver including an input connected to said output of said output stage and including an output, said receiver further including comparison means connected between said receiver input and said receiver output and operable to compare the signal at said test pin with a selected reference;

a memory connected to said output of said receiver for storing information supplied to said comparison means; and

a bidirectional line connecting said output of said output stage and said input of said receiver to said test pin.

4,399,406

TEST HEAD FOR ELECTRON SPIN RESONANCE AND PARAMAGNETIC ELECTRON RESONANCE MEASUREMENTS

Reinhard Biehl, Karlsruhe, and Dieter Schmalbein, Marxzell-Burbach, both of Fed. Rep. of Germany, assignors to Bruker Analytische MeBtechnik GmbH, Silberstreifen, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,865

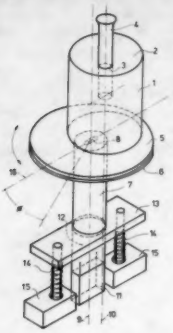
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022481

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—316 **8 Claims**

1. A test head for electron spin resonance and paramagnetic electron resonance measurements comprising a resonator of circular cylindrical shape adapted to accommodate a coaxially arranged test tube, and a waveguide arrangement for exciting the H_{011} wave in the resonator, said waveguide arrangement comprising one section having its one end arranged adjacent one face of the resonator and communicating with the resonator via an opening provided in the face in eccentrical arrangement relative to the resonator, characterized in that the wave-

guide section carrying a H_{1n} wave communicates with the resonator via a coupling slot the angular position (ϕ) of which



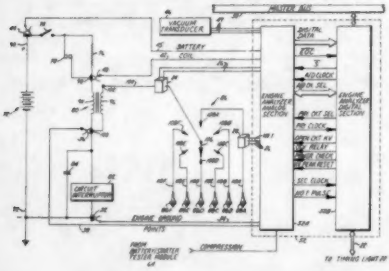
can be varied relative to the radial plane of the resonator passing through its centre.

4,399,407

ENGINE ANALYZER WITH CONSTANT WIDTH DIGITAL WAVEFORM DISPLAY

Michael J. Kling, Mequon, and Joseph A. Marino, Waukesha, both of Wis., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Dec. 4, 1981, Ser. No. 327,511
Int. Cl.³ F02P *17/00*
U.S. Cl. 324—379 **21 Claims**



1. A test system for testing operation of a selected system or component of an internal combustion engine, the test system comprising:

means for providing a periodic analog input waveform representative of operation of the system or component of the internal combustion engine under a test condition, the periodic analog input waveform having a period which varies as a function of engine speed;

analog-to-digital (A/D) converter means for sampling the analog input waveform periodically at a data sample rate and converting each sample to a digital value;

means for controlling the data sample rate of the analog-to-digital converter means as a function of the period of the input waveform to produce a predetermined number of digital values representative of the input waveform;

data memory means for storing the predetermined number of digital values; and

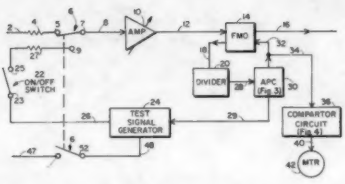
display means for displaying a simulated visual representation of the input waveform based upon the stored predetermined number of digital values, the simulated visual representation being representative of operation of the system and component of the internal combustion engine under the test condition.

4,399,408

APPARATUS FOR TESTING THE LINEARITY OF A FREQUENCY MODULATED OSCILLATOR

Abram Froese, North Vancouver, and Josef L. Fikart, Port Coquitlam, both of Canada, assignors to Ael Microtel, Ltd., Burnaby, Canada

Filed Mar. 2, 1981, Ser. No. 239,758
Int. Cl.³ G01R *23/15*
U.S. Cl. 324—78 Z **3 Claims**



1. Apparatus for testing the linearity of a frequency modulated oscillator (FMO) having a modulation input and operating at an assigned carrier frequency comprising:

means for periodically applying a modulation test frequency signal to the modulation input of the FMO so as to alternately obtain the carrier alone and a modulated signal (resulting from the periodic application of said modulation test frequency signal) at the output of said frequency modulated oscillator;

means responsive to the average output frequency of said frequency modulated oscillator to alternately generate a first DC control signal derived from said carrier signal and a second DC control signal derived from said modulated signal;

means for separately comparing said first and second control signals with a DC reference voltage so as to provide at an output an error signal representative of the magnitude and sign of the difference between the amplitude of said first and second control signals; and

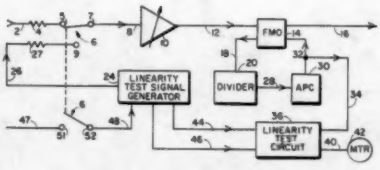
means for measuring the magnitude and sign of the error signal so as to determine when the difference has been set to a minimum.

4,399,409

APPARATUS FOR TESTING THE LINEARITY OF A FREQUENCY MODULATED OSCILLATOR

David Thompson, Coquitlam, Canada, assignor to AEL Microtel, Ltd., Burnaby, Canada

Filed Mar. 2, 1981, Ser. No. 239,760
Int. Cl.³ G01R *23/15*
U.S. Cl. 324—78 Z **8 Claims**



1. Apparatus for testing the linearity of a frequency modulated oscillator comprising:

timing means generating first and second synchronizing signals and a first timing signal;

logic means responsive to said first timing signal for applying short bursts of a modulating test signal to the oscillator so as to alternately obtain a carrier alone and a deviated signal at the output of the oscillator;

first means responsive to an output signal of the oscillator for

alternately generating a first DC control signal voltage derived from the carrier signal and a second DC control signal derived from the deviated signal;

second means responsive to said first and second synchronizing signals and sequentially responsive to said first and second control signals for providing at an output terminal an error signal representative of the magnitude and sign of the difference between the magnitudes of said first and second control signals; and

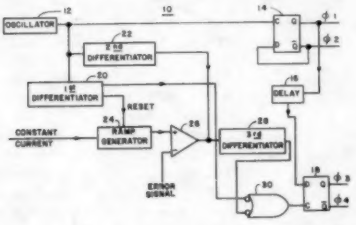
third means responsive to the error signal at said output terminal of said second means for measuring the magnitude and sign of the error signal so as to determine when the difference has been set to a minimum.

4,399,410

CIRCUIT FOR GENERATING TWO PERIODIC SIGNALS HAVING A CONTROLLABLE PHASE RELATIONSHIP THEREBETWEEN

Gary G. Siegmund, Elyria, and Robert J. Kretschmann, Bay Village, both of Ohio, assignors to Reliance Electric Co., Cleveland, Ohio

Filed Aug. 10, 1981, Ser. No. 291,455
Int. Cl.³ H03K *5/153*
U.S. Cl. 328—55 **19 Claims**



1. A circuit for generating as a function of the amplitude of a d.c. control signal at least two periodic output signals having a phase relationship controllable between zero and 180 degrees, said circuit comprising:

(a) oscillator means for generating a periodically recurring signal of predetermined frequency and waveform said signal having during each period a first portion of first predetermined amplitude and a second portion of second predetermined amplitude;

(b) means responsive to said oscillator means signal for generating a periodically recurring signal having a ramp waveform said ramp starting each time said first portion of said oscillator signal begins;

(c) means for comparing said ramp signal to said d.c. control signal said comparison means generating a signal having a first amplitude when said d.c. control signal exceeds said ramp signal and a second amplitude when said ramp signal exceeds said control signal;

(d) first output means responsive to the beginning of said first portion of said oscillator signal for generating one of said periodic output signals;

(e) means responsive to the periodic output signal generated by said first output means for generating a delayed version thereof; and

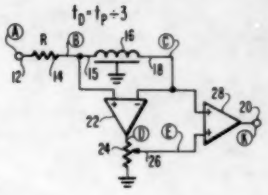
(f) second output means responsive to said signal generated by said comparator means and said signal generated by said delay means for generating when said comparator means signal changes from said first amplitude to said second amplitude the other of said periodic output signals whereby the phase relationship between said periodic output signals is controlled as a function of said d.c. control signal to be between zero and 180 degrees.

4,399,411

QUANTIZED VIDEO SIGNAL LEVEL INTERPOLATOR

Donald F. Dion, Burlington, and Michael J. Cantella, Winchester, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1981, Ser. No. 304,379
Int. Cl.³ H03K *5/159*; H04N *5/14*; H03K *4/02*; G09G *1/08*
U.S. Cl. 328—56 **9 Claims**



1. A quantized signal level interpolator for interpolating at least one intermediate amplitude step into an input signal applied to an input terminal which signal changes from a first amplitude X to a second different amplitude Z, comprising in combination:

a delay line of electrical length T with characteristic resistance value R and being unterminated at one end;

a resistor series connected between said input terminal and other end of said delay line and being of value R;

an output terminal coupled to said other end of said delay line, whereby when said input signal changes from amplitude X to amplitude Z a signal of amplitude intermediate X and Z appears at said output terminal until a time 2 T later when a signal of amplitude Z appears; and

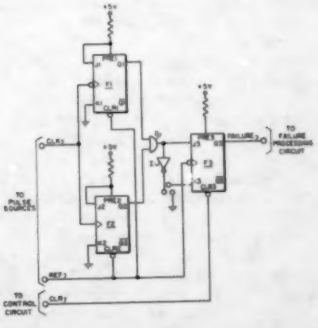
means responsive to the signals appearing at both ends of said delay line for producing a difference signal, corresponding to the sum of the signal at said other end and inverse of said signal at said one end and means having an output connected to said output terminal and responsive to said difference signal and signal at said one end for producing a signal which corresponds to the sum of those two signals.

4,399,412

DUTY CYCLE MONITOR CIRCUIT

Gerald M. Rinaldi, Mundelein, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 21, 1981, Ser. No. 332,919
Int. Cl.³ H03K *5/26*
U.S. Cl. 328—112 **8 Claims**



vide clock signal pulses having a pulse width greater than the pulse width of said reference signal pulses, and abnormally operated to provide clock signal pulses having positive and negative going edges and a pulse width narrower than the pulse width of said reference signal pulses, said duty cycle monitor circuit comprising:

detection means connected to said reference signal source and said clock signal source, operated in response to a reference signal pulse of said first polarity and contemporaneously occurring first and second edges of a clock signal pulse to provide a duty cycle detected signal;

said detection means further operated in response to each reference signal pulse of said second polarity to clear said duty cycle detected signal; and

storage means connected to said detection means and to said reference signal source, operated in response to said reference signal pulse of said second polarity and said duty cycle detected signal to provide a duty cycle failure signal.

4,399,413

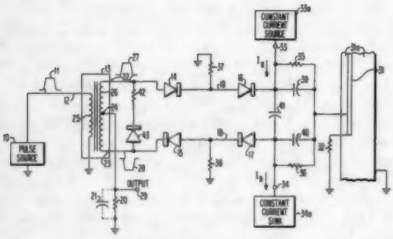
HIGH SPEED SAMPLING HEAD

Robert J. Bosselaers, Winchester, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 10, 1981, Ser. No. 233,194

Int. Cl.³ H03K *5/00, 17/00, 17/74, 17/58*

U.S. Cl. 328—151 **9 Claims**



1. An apparatus for sampling the instantaneous level of a radio frequency (RF) signal conducted by a transmission line, said apparatus comprising:

source means for providing an input signal having a pulse of predetermined width;

means coupled to said source means for transforming said input signal into two balanced signals;

a pair of conductors coupled at their first ends to said transforming means to conduct said balanced signals, respectively, in forward and reverse directions at a predetermined velocity;

first and second diodes individually coupled at their first ends to the second ends of said pair of conductors, said first and second diodes configured to conduct forward current in conformity with said balanced signals;

first and second resistors coupled at their first ends to the second ends of said first and second diodes, respectively, said first and second resistors coupled at their second ends to said transmission line conducting said RF signal;

means for coupling a source of constant current to said first and second resistors to thereby provide constant biasing potentials at said first and second diodes referenced to the instantaneous amplitude of said RF signal;

means coupled to said transforming means for sensing the signals on said pair of conductors and thereby provide a measure of the instantaneous amplitude of said RF signal; and

means for blocking the signal on said pair of conductors from said sensing means in the absence of said input signal.

4,399,414

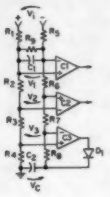
LOW-NOISE PULSE CONDITIONER

David A. Bird, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 16, 1981, Ser. No. 274,120

Int. Cl.³ H03K *5/153;* **G01R** *19/04, 19/175*

U.S. Cl. 328—151 **4 Claims**



1. A differential-to-peak detector, comprising:

a comparator amplifier having an inverting input, a non-inverting input and an output;

a signal attenuating input circuit means for attenuating said differential input signal and applying said attenuated input signal to said inverting input of said comparator;

a storage capacitor connected at one end to ground potential;

a first resistor connected between the grounded end of said capacitor and said non-inverting input of said amplifier;

a second resistor connected between the other end of said capacitor and said inverting input of said amplifier; and

a rectifying means for coupling the output voltage of said amplifier across said capacitor when the attenuated differential input signal voltage exceeds the voltage across said capacitor so that said capacitor remains charged to a selected voltage level proportional to the peak voltage of said differential signal.

4,399,415

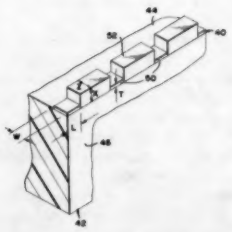
RESONANT ISOLATOR FOR MASER AMPLIFIER

Robert C. Clauss, La Crescenta, and Rex B. Quinn, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1981, Ser. No. 246,778

Int. Cl.³ H01P *1/00;* **H01S** *1/00;* **H01P** *1/32*

U.S. Cl. 330—4 **11 Claims**



1. In a traveling wave maser which includes a pumped channel, a maser material strip extending along the channel, a slow wave structure including multiple comb fingers spaced along the channel, and means for applying a magnetic field within said channel, the improvement of an isolator extending along the channel, comprising:

a train of isolator portions extending along said channel substantially parallel to said slow wave structure, each

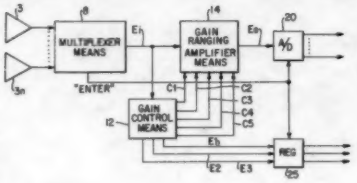
isolator portion formed of magnetic material, a first group of said isolator portions formed of microwave resonance isolator material and being spaced apart and with each first isolator portion lying halfway between a postion opposite a pair of adjacent comb fingers, and the isolator portions of said first group having sharply different magnetic permeability under the operating magnetic field in said channel than isolator portions lying between said first isolator portions.

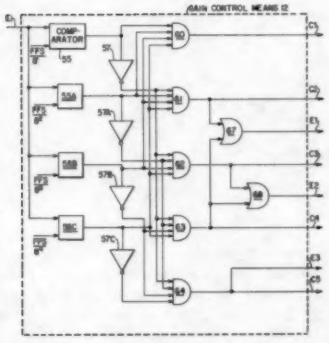
4,399,416

FLOATING POINT AMPLIFIER

Ronald G. Gillespie, Old Tappan, N.J., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,358
Int. Cl.³ H03G 3/20
U.S. Cl. 330—86 **10 Claims**





1. A wide dynamic range automatic gain ranging amplifier system comprising

means for receiving an analog input signal to provide a received input signal,

amplifier means connected to the receiving means for amplifying a received analog input signal provided by the receiving means in accordance with gain control signals to provide an amplified signal,

gain signal means connected to the receiving means and to the amplifier means for providing the gain control signals to the amplifier means corresponding to a desired gain for the amplifier means in accordance with the received input signal and in a manner so as to substantially instantaneously control the gain of the amplifier means and for providing gain status signals representative of the gain associated with the amplified signal in binary digital form, and

and analog-to-digital converter means connected to the amplifier means and providing digital signals corresponding to the amplified signal; and

said gain signal means includes means connected to the receiving means for comparing a received analog input signal with a plurality of reference input signals and providing corresponding comparison signals, each reference input signal being representative of a ratio of a value, corresponding to a predetermined fractional full scale capability of the analog-to-digital converter means, to a different predetermined gain fo the amplifier means, and

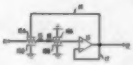
decoding means connected to the comparing means for decoding the comparison signals so as to substantially instantaneously provide the gain control signals and the gain status signals.

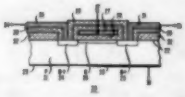
4,399,417

INTEGRATED CRC FILTER CIRCUIT

James P. Ballantyne, Wyomissing Hills, Pa.; Paul E. Fleischer, Little Silver, N.J.; Kenneth R. Laker, Staten Island, N.Y., and Aristides A. Yiannoulos, Wyomissing Hills, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 6, 1980, Ser. No. 157,452
Int. Cl.³ H01L 29/94, 27/04; H03H 7/01
U.S. Cl. 330—109 **4 Claims**





3. In combination

a semiconductive integrated capacitor-resistor-capacitor filter adapted for use in a filter circuit comprising,

a semiconductive body having a bulk portion of one conductivity type, a pair of spaced surface zones of the opposite conductivity type and of relatively low resistivity, and a localized surface channel of said opposite conductivity type and of relatively high resistivity extending between said spaced zones,

a dielectric gate layer overlying said channel,

a conductive gate layer overlying said dielectric gate layer,

separate terminal connections to each of said spaced zones, the bulk portion and the conductive gate layer,

the doping of said channel and the thickness of the dielectric layer being so related that in the operating voltage range of the input means the resistivity of said channel is substantially independent of such voltage,

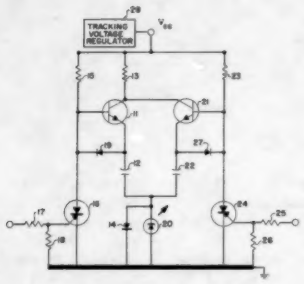
the pair of terminals to the spaced zones providing therebetween a useful filter circuit resistance, and each of the pairs of terminals consisting of one from the connections to the spaced zones and the other from a connection to either the conductive layer or the bulk providing therebetween a useful filter circuit capacitance, and

input means for supplying to said filter a signal having substantial components with frequencies comparable to the inverse of the RC time constant of said filter, whereby such components are filtered.

4,399,418
LASER MODULATOR

Howard M. Forrester, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 4, 1979, Ser. No. 72,732
Int. Cl.³ H03K 17/00
U.S. Cl. 332—7.51 4 Claims

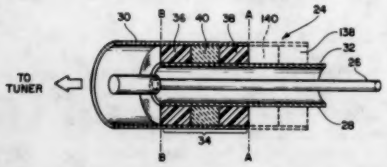


1. A pulsed laser system comprising:
a stripline circuit including a ground plane electrode;
a two-terminal laser diode having one terminal connected to said ground plane electrode;
first and second two-terminal, low-inductance, disc-type capacitors each having one terminal thereof connected to the other terminal of said laser diode;
a reverse-connected diode connected in parallel with said laser diode to provide a charging path for said first and second capacitors;
first and second charging transistors each having an emitter connected to the other terminal of said first and second charging transistors each having a collector effectively connected to a source of charging potential;
said first and second charging transistors each having a base effectively connected to said source of charging potential via first and second bias resistors, respectively;
first and second clamp diodes connected between the junction of said first and second emitter/capacitor and said first and second base respectively; and
first and second discharge switches connected between said first and second bases and said ground plane electrode for discharging said first and second capacitors through said laser diode to produce a laser light pulse.

4,399,419
LINE ISOLATION AND INTERFERENCE SHIELDING FOR A SHIELDED CONDUCTOR SYSTEM

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 132,020, Mar. 20, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,824
Int. Cl.³ H03H 7/01; H01P 1/202, 1/215
U.S. Cl. 333—12 56 Claims

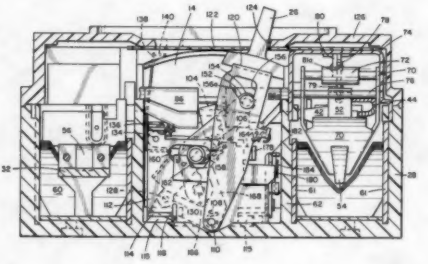


20. In a system employing a shielded conductor which carries a desired high frequency signal, and whose shield is adapted to be coupled to a low frequency power source, an isolator for isolating the conductor's shield from the low frequency power source and for shielding the desired field within the conductor from ambient high frequency electromagnetic interference, comprising:
means defining an interruption in the shield; and
a series of dielectric elements separated by magnetically absorptive material filling said interruption to create a capacitive coupling across the interruption to isolate the shield and magnetic absorption within the interruption to absorb energy associated with the ambient electromagnetic interference.

4,399,420
MAIN CIRCUIT BREAKER

Neil R. Palmer, Swisher, and John M. Winter, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Sep. 11, 1981, Ser. No. 301,354
Int. Cl.³ H01H 73/48
U.S. Cl. 335—21 29 Claims



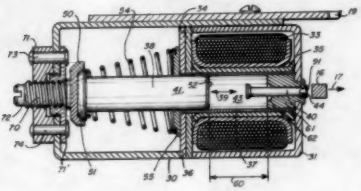
1. A circuit breaker for use in a panelboard having a power supply extending through either a top or a bottom wall of said panelboard to supply electrical power to a conductor having a longitudinal axis located in a vertical plane and adapted to be connected to a load, comprising:
a pair of contacts adapted to be connected between said conductor and said supply,
pivot means for pivoting one of said contacts in one direction about a horizontal axis transverse to the longitudinal axis of said conductor for engagement with the other contact to extend power from said supply to said conductor and for disengagement from said other contact in response to pivoting movement of said one contact in the opposite direction about said horizontal axis to interrupt power to said load,
an operating assembly having a handle projecting from said breaker for rotation about a vertical axis parallel to the longitudinal axis of said conductor whereby said handle moves in one horizontal direction to move said operating assembly to an ON position and moves said operating assembly to an OFF position in response to rotation of said handle in the opposite horizontal direction whereby said vertical axis is substantially perpendicular to said horizontal axis although not coplanar,
and last means interconnecting said operating assembly with said pivot means for pivoting said one contact in said one direction in response to said operating assembly moving to said ON position and for pivoting said one contact in said opposite direction in response to said operating assembly moving to said OFF position.

4,399,421

LOCK-OUT RELAY WITH ADJUSTABLE TRIP COIL

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.

Filed Feb. 12, 1981, Ser. No. 233,857
Int. Cl.³ H01H 9/00
U.S. Cl. 335—174 7 Claims



1. A lockout relay for use in protecting electrical systems, said lockout relay comprising a tripping solenoid for use in connection with actuating a mechanical movement in said relay,

said solenoid comprising,

a coil determining a magnetic field therein and aiding in defining an air gap between a plunger and a stop plug,

said plunger having a first end and a second end and being mounted for reciprocal movement along a center line toward and away from said stop plug,

a push rod aligned with said center line for reciprocal movement and having an inner end positioned to be actuated by said plunger second end and having an outer end positioned to actuate said mechanical movement,

a return spring means opposing movement of said plunger toward said push rod inner end,

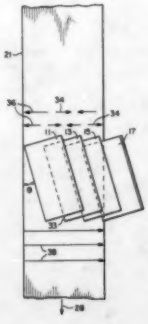
and adjusting means for positioning said plunger second end with respect to said coil magnetic field in accordance with a predetermined threshold voltage, reluctance and response time to activation of said plunger by said magnetic field.

4,399,422

MAGNETIZING APPARATUS

Alfred M. Nelson, Redondo Beach, Calif.; Houshang Rasekhi, Convent Station, and John J. Sudano, Paterson, both of N.J., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 31, 1981, Ser. No. 297,672
Int. Cl.³ H01F 13/00
U.S. Cl. 335—284 10 Claims



1. Apparatus for applying magnetic fields to a magnetizable medium to render same substantially uniformly magnetized in one direction across and parallel to the medium and comprising:

a first plurality of magnets arranged in an array extending across the width of said medium and the magnetic fields created by each of said first plurality of magnets interact to effect a substantially uniform and continuous magnetic field in said one direction across said medium, and

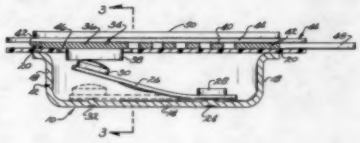
a second plurality of magnets arranged in an array extending across the width of said medium and substantially parallel to said first plurality of magnets, the magnetic field created by said second plurality of magnets interact to effect a substantially uniform and continuous magnetic field in said one direction and also interact with the magnetic field created by said first plurality of magnets to substantially suppress components of said magnetic fields perpendicular to said medium while maintaining said magnetic fields created by said first and second plurality of magnets uniform and continuous and being substantially parallel to said medium to uniformly magnetize said medium in said one direction across the width of said medium as relative movement is affected between said medium and said first and second plurality of magnets.

4,399,423

MINIATURE ELECTRIC CIRCUIT PROTECTOR

Joseph G. Nield, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 29, 1982, Ser. No. 363,187
Int. Cl.³ H01H 61/02
U.S. Cl. 337—102 15 Claims



1. A thermally responsive electrical circuit protector comprising an electrically and thermally conductive housing having a bottom wall and upstanding side walls with an open top, the side walls having free ends formed into a ledge portion, a generally flat plate like element disposed on the ledge portion with an electrically insulative gasket interposed therebetween to electrically separate the housing from the plate like element, means to clampingly attach the plate like element to the housing, heat responsive electrical switch means disposed in the housing adapted to connect and disconnect the housing and the plate like member upon the occurrence of selected thermal conditions and terminal means respectively attached to the housing and plate like member characterized in that the plate like element is formed with three integral portions, the first portion mounting a portion of the switch means, a second portion having a selected heater configuration and a third mounting portion adapted to be supported by the ledge portion of the housing.

4,399,424

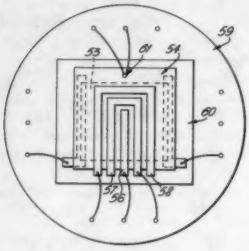
GAS SENSOR

Leslie J. Rigby, Bishops Stortford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,290
Claims priority, application United Kingdom, Oct. 7, 1980, 8032248
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 3 Claims

1. A hydrogen sulphide gas sensor comprising: a substrate insulator; first and second parallel conductive strips forming electrodes affixed to said substrate insulator in spaced relation to each other; a layer of a resistive heater material affixed to said substrate insulator and to said first and second strips; a dielectric film having obverse and reverse sides, said dielectric film having said reverse side thereof covering and fixed rela-

tive to said resistive heater material; third and fourth conductive strips forming electrodes, said third and fourth conductive strips being fixed to the obverse side of said dielectric film, said third and fourth conductive strips being long and thin in comparison to their widths, said third conductive strip being straight, said fourth conductive strip being U-shaped and straddling said third conductive strip, said fourth conductive strip having one leg on each side of and parallel to said third conductive strip, said legs being connected by a bight portion, each of said legs being uniformly spaced from said third conductive strip; and a semiconductive film fixed to said dielectric film between and in contact with said third and fourth conductive strips in a position to be heated by said heater means, said semiconductive film having a resistivity which decreases with an increase of hydrogen sulphide concentration in a gas contacting the same, said semiconductive film comprising tin oxide doped with alumina.

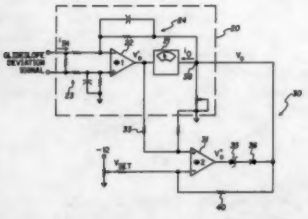


4,399,425

CIRCUIT FOR OPERATING A FLIGHT NAVIGATION INDICATOR

Lothar J. Taylor, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 12, 1981, Ser. No. 224,609
Int. Cl.³ G08G 5/00
U.S. Cl. 340—27 NA **15 Claims**



1. In an aircraft navigation system wherein course indicating information is displayed on a cockpit indicator, the improvement comprising:

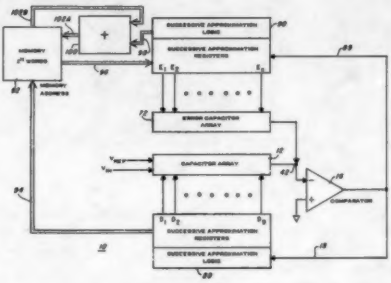
means for controlling said cockpit indicator for providing (1) a linear display on said indicator solely in response to a signal representing course information falling within a first signal range, (2) a first constant display on said indicator solely in response to said signal falling within a second signal range, and (3) an off-scale display on said indicator solely in response to said signal falling within a third signal range.

4,399,426

ON BOARD SELF-CALIBRATION OF ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTERS

Khen-Sang Tan, 709 Arbor Downs Dr., Plano, Tex. 75023

Filed May 4, 1981, Ser. No. 260,435
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 CC **11 Claims**



1. A self calibrating charge-redistribution analog-to-digital converter comprising:

a first binary weighted capacitor array having a plurality of capacitors, one plate of each of said capacitors being electrically connected to a node,

a comparator having one input electrically connected to said node,

first logic means connected to said comparator output and said array for selectively connecting said capacitors to preselected voltages, and

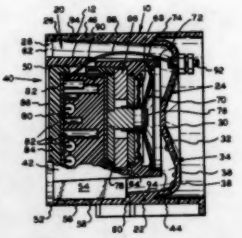
at least one second binary weighted error capacitor array electrically connected to said node and having a plurality of capacitors for determining the error correcting signal required at said node to correct the binary mismatch of preselected capacitors in said first array, each said capacitors in said error capacitor array being connected through a scaling capacitor to said node.

4,399,427

REVERSE ALARM

James A. Neese, Flora, Ill., assignor to Sparton Corporation, Jackson, Mich.

Filed May 5, 1981, Ser. No. 260,793
Int. Cl.³ G08B 3/00; G10K 9/12
U.S. Cl. 340—388 **6 Claims**



1. An electronic alarm comprising, a housing, mounting means formed on said housing, said housing including a dish shaped cavity defined by a sidewall and an inner projector wall intersecting said sidewall, said cavity including an opening intersecting an exterior surface of said housing, said projector wall facing said opening, a diaphragm mount assembly located within said cavity having an axis and an inner end and an outer

end, a sound producing diaphragm supported upon said assembly inner end, diaphragm vibrating means supported on said assembly inner end operatively connected to said diaphragm, control means controlling operation of said diahragm vibrating means mounted upon said diaphragm mount assembly, a flange defined on said diaphragm mount assembly outer end radially disposed to said assembly axis and extending outwardly with respect to said axis, said flange overlying said cavity opening at the intersection thereof with said housing exterior surface and in alignment with said cavity sidewall, means affixing said flange to said housing at said cavity opening, air passage means defined between said diaphragm mount assembly and cavity sidewall communicating with said opening and said projector wall, port means defined in said flange in alignment with said air passage means, said diaphragm being disposed in opposed spaced relation to said inner projector wall whereby sound vibrations produced by said diaphragm reflect from said projector wall through said air passage means and port means.

4,399,428

THERMOSTAT

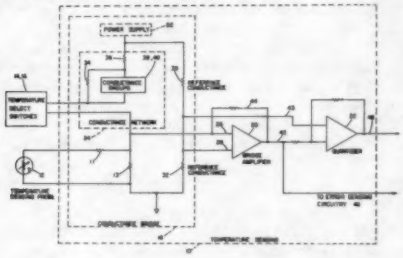
Paul R. Hughes, Sudbury, and John E. Campbell, Brookline, both of Mass., assignors to United Brands Company, New York, N.Y.

Division of Ser. No. 882,885, Mar. 2, 1978, Pat. No. 4,240,077. This application Jan. 25, 1980, Ser. No. 115,413

The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.

Int. Cl.³ G08B *23/00, 21/00;* F25B *49/00;* G05D *23/24*

U.S. Cl. 340—500 **8 Claims**



1. A device for monitoring and controlling the temperature of products within an enclosure comprising: a bridge circuit having as a first leg a temperature sensing, self-linearizing network that includes a thermistor arranged with a plurality of resistors, one in series and one in parallel with said thermistor, said network establishing a substantially linear overall conductance curve for said first leg over a temperature range of interest, and a digital set point selector network in a second leg of said bridge circuit to select digital values of the temperature over said range of interest, said set point network comprising: a set of conductances, said conductances being connected in parallel with one another, each said conductance of said set having a switch element in series with it, and a further conductance in parallel with said set of conductances, said further conductance having a value to establish a first conductance limit of the selector network when all of the conductances in said set of conductances are switched out of said network thereby to define a bridge balance point at one end of said temperature range of interest, the values of said conductances of said set being predetermined to establish, by selective switching, a series of decimal temperature bridge balance points over said linearized portion of said conductance curve of said sensing network thereby to establish a progressive series of temperature set points in decimal steps; a bridge amplifier connected to the bridge circuit to generate an error signal output when the sensed temperature of said temperature sensing self-linearizing network differs from the selected temperature of said digital set point selector network; and signaling means responsive to the amplifier error signal output for giving warning or signaling correction to temperature control means.

4,399,429

ELECTRONIC ADAPTER FOR A DIAGNOSTIC PICKUP OF DATA SUPPLIED BY AN ELECTRONIC CONTROL CIRCUIT

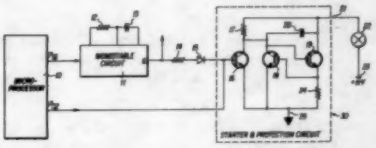
Alain Laporte, Villate, France, assignor to Renix Electronique S.A., Toulouse, France

Filed Sep. 23, 1981, Ser. No. 304,782

Claims priority, application France, Sep. 23, 1980, 80 20390

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—507 **5 Claims**



1. An electronic adapter for the pickup of diagnostic data supplied by an electronic control circuit of the type including a microprocessor, said adapter comprising:

monitoring circuit means coupled to receive a first output of said microprocessor for monitoring the operational state of said microprocessor;

starter and protection circuit means coupled to receive the output of said monitoring circuit from an output terminal of said monitoring circuit means and coupled to receive said diagnostic data from a second output of said microprocessor for processing said output of said monitoring circuit means and said diagnostic data to produce processed data and for supplying said processed data in serial form to an output terminal of said starter and protection circuit means; and

display means coupled to said output terminal of said starter and protection circuit means for displaying that a malfunction has occurred in at least one of said electronic control circuit and a plurality of input and output peripheral devices.

4,399,430

INTRUDER DETECTION SECURITY SYSTEM

Cedric A. Kitchen, Holywell, Wales, assignor to Pilkington P.E. Limited, St. Helens, United Kingdom

Filed Oct. 7, 1981, Ser. No. 309,418

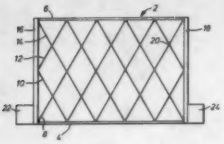
Claims priority, application United Kingdom, Oct. 10, 1980, 8032770

Int. Cl.³ G08B *13/12*

U.S. Cl. 340—550 **22 Claims**

1. A security system comprising at least two elongated members (4, 6, 8, 10, 12, 14) together forming a mesh-like intruder detection structure characterised in that at least one of the elongated members (4, 6, 8, 10, 12, 14) is or includes a fibre-optic waveguide, the structure having a number of jointing points (20) at which portions of at least two elongated members (4, 6, 8, 10, 12, 14) are secured by securing means (40, 48, 50, 52, 54) in a position fixed relative to one another, means

being provided to ensure damage to the waveguide when one of the elongated members (4, 6, 8, 10, 12, 14) is subjected to a



predetermined load, and a warning device (24, 34) to produce an alarm condition in response to damage to the waveguide.

4,399,431

ALARM OR WARNING DEVICE FOR SIGNALING LEFT-BEHIND MASTER OR ORIGINAL

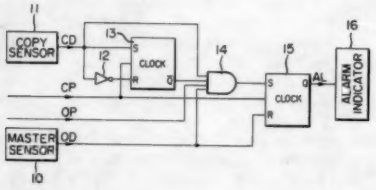
Toyokazu Satomi, Yokohama; Yoshiaki Kanmoto, Toyko, and Yasuhiro Tabata, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,399

Claims priority, application Japan, Oct. 23, 1980, 55-147587; Nov. 6, 1980, 55-155157; Nov. 10, 1980, 55-156976

Int. Cl.³ G08B *13/14*

U.S. Cl. 340—568 **5 Claims**



1. In a copying machine an alarm system for giving the warning signal that a master is left behind, comprising

a master detection means for detecting whether or not a master is set on the master stand,

a copy detection means for detecting whether or not one or more copies exists in the copy discharge tray, and

an alarm indicator adapted to be activated when said copy detection means detects that no copy exists in the copy discharge tray and said master detection means detects the master still remaining on the master stand after the completion of one copying operation.

4,399,432

AUDIO SIGNALING DEVICE AND METHOD

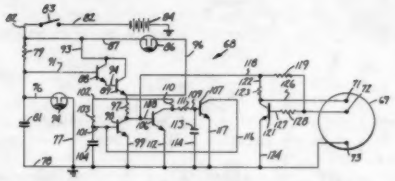
David J. Lunn, 24350 Falcon Ave., Forest Lake, Minn. 55025

Filed Feb. 20, 1981, Ser. No. 236,256

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—573 **28 Claims**

1. An audio signal device carried by a dog operable to provide separate audio signals indicating to a dog handler movement of the dog and a stationary condition of the dog comprising: electrically operated audio signal generator means operable to produce a sound, electronic circuit means electrically connected to the signal generator means to drive the signal generator means whereby the signal generator means produces an audible sound, an electric power source, on-off switch means connected to the power source and the circuit means, said switch means when turned on electrically connecting the power source and circuit means, and means for supporting the circuit means, power source, and switch means, said means for supporting the circuit means, power source, and switch means comprising a body encapsulating the circuit means and attached to the signal generator means, said body having a cavity accommodating the power source, a tube located within said body, said switch means being located within said tube, said tube having an open end providing access to the switch means whereby the switch means can be selectively turned on and off,



said circuit means having means responsive to movement of the dog to provide electric power to the signal generator means whereby the signal generator means produces first audio signals, said means of the electronic circuitry being responsive to a stationary condition of the dog to withhold electric power to the signal generator means for a limited period of time whereby the signal generator means does not produce audio signals and then provide electric power to the signal generator means whereby the signal generator means produces second audio signals, said second audio signals being different from the first audio signals whereby movement or stationary conditions of the dog can be ascertained by the dog handler.

4,399,433

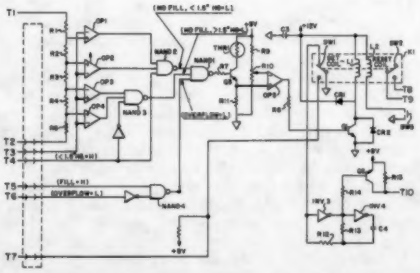
ALARM SYSTEM FOR A TISSUE PROCESSOR

Nevitt M. Louder; Carlo E. Cuomo, both of Verona, and Paul F. Secosky, Greensburg, all of Pa., assignors to Allied Corporation, Morris Township, N.J.

Filed Sep. 10, 1981, Ser. No. 300,820

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—626 **7 Claims**



1. A shut-down and/or annunciator system for a vacuum vessel arranged to be filled with liquid by application of a vacuum thereto comprising:

a vacuum sensitive switch that outputs a logic signal indicative of whether the vacuum in the vessel is above or below a preselected level;

a timer circuit for generating first and second gate signals, the first gate signal after the first few seconds of a filling

period and the second gate signal during the last few seconds of the filling period;

means for generating a short duration shut-down signal in response to the first gate signal and the output of the vacuum switch or the second gate signal and the output of the vacuum switch; and

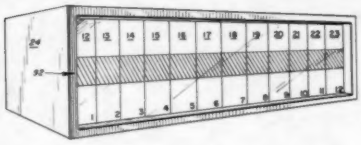
a mechanical latch responsive to said shut-down signal for outputting a continuous shut-down and/or alarm signal.

4,399,434

LINE INDICATING APPARATUS

Norbert J. Bielat, 720 South Bristol, Arlington Heights, Ill. 60005

Filed Jun. 8, 1981, Ser. No. 271,412
Int. Cl.³ G09G *3/00*
U.S. Cl. 340—701 **16 Claims**



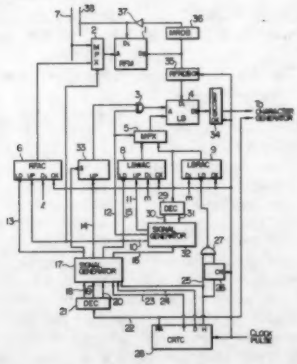
1. In a line indicating apparatus for presenting the stages or conditions of a plurality of monitored variables, means for sensing the states or conditions of said variables and providing outputs, visual means responding to said outputs for visually presenting said outputs, and means for aligning said visual means in a straight line, the improvement wherein each of said visual means comprises two or more indicating sections, and means for exciting at least each section to represent a normal operating range of the respective variable, whereby, when all of said variables are in their normal operating ranges, each section associated with normal operating range in each visual means will be excited and all of said excited sections will present a single highly visible normal operating line or band.

4,399,435

MEMORY CONTROL UNIT IN A DISPLAY APPARATUS HAVING A BUFFER MEMORY

Kiichiro Urabe, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,003
Claims priority, application Japan, Feb. 8, 1980, 55-13726
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—750 **14 Claims**



1. A memory control unit in a display apparatus comprising:

(a) first memory means for storing coded data to be displayed over a plurality of rows on a display screen;

(b) first address means for designating addresses for reading out said coded data from said first memory means during a horizontal flyback period of the raster scan;

(c) second memory means having a memory capacity corresponding to at least two coded data rows on said display screen for storing coded data read out of said first memory means in groups corresponding to a display screen row; and

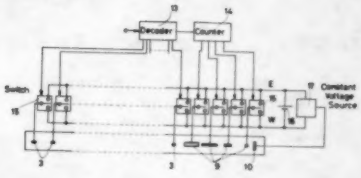
(d) second address means for providing said second memory means with read addresses to read out the coded data stored in the second memory during a data display period and for providing said second memory means with write addresses to write therein display data from said first memory means of the next row of data during horizontal flyback periods of the raster scan of a coded data row.

4,399,436

ELECTROCHROMIC DISPLAY DEVICES

Hiroshi Hamada, 33-104 Higashikidera-cho 1-chome, Nara-shi, Nara-ken, Japan; Kohzo Yano, Yamatokoriyama, Japan; Katubumi Koyanagi, Nara, Japan; Hiroshi Take, Ikoma, Japan, and Yasuhiko Inami, Nara, Japan, assignors to Hiroshi Hamada, Osaka, Japan

Filed May 29, 1981, Ser. No. 268,410
Claims priority, application Japan, May 30, 1980, 55-73915
Int. Cl.³ G09G *3/16*
U.S. Cl. 340—812 **7 Claims**



1. An electrochromic display device comprising:

a plurality of display segmented electrodes and first additional electrodes;

a layer of an electrochromic material in contact with each of the display segmented electrodes and the first additional electrodes;

first connecting means for selectively connecting each of said display segmented electrodes into one of two groups, depending on a display pattern to be indicated;

counting means for counting the display segmented electrodes in at least one group and determining the difference in display area between the two groups of display segmented electrodes;

second connecting means responsive to said counting means for connecting each of said first additional electrodes into one of the two groups of the display segmented electrodes;

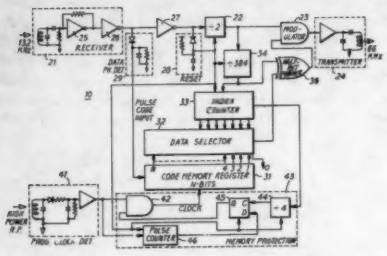
power supply means for supplying power to each of the two groups of the first additional electrodes and display segmented electrodes; and

a second additional electrode for keeping the total amount of charge for coloring the display electrodes constant.

4,399,437
CODED INFORMATION ARRANGEMENT

John B. Falck, London, and David Robson, Great Barton, both of England, assignors to Tag Radionics Limited, Rochford, England

Filed May 19, 1981, Ser. No. 265,324
Claims priority, application United Kingdom, May 19, 1980, 8016458
Int. Cl.³ H04Q 9/00; G06K 19/00
U.S. Cl. 340—825.54 9 Claims

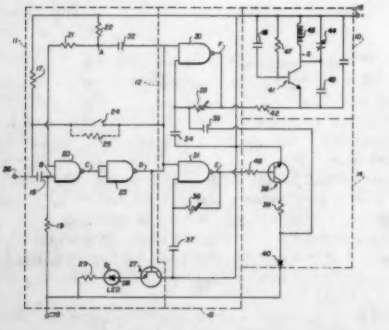


1. An active transponder device comprising first signal receiving means for receiving an input signal including coded information, a memory for storing said information, transmitter means for transmitting an output signal including said information, second signal receiving means and a program protection circuit, said program protection circuit being connected to receive signals from said first and second signal receiving means and being further connected to said memory, and said program protection circuit comprising means responsive to a predetermined time relationship between respective signals received from said first and second signal receiving means to enable the memory for storage of said coded information.

4,399,438
CODED SIGNAL RADIO TRANSMITTER FOR REMOTE CONTROL MECHANISMS

Edgar L. Bonner, Rte. 4, Box 101-B, Taylorsville, N.C. 28681

Filed Jul. 28, 1981, Ser. No. 287,694
Int. Cl.³ H04B 7/00; H04Q 9/00
U.S. Cl. 340—825.72 13 Claims

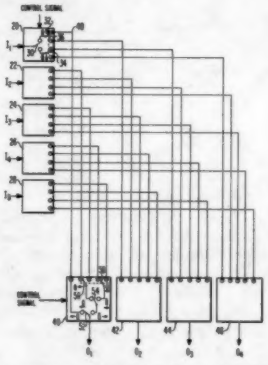


8. A radio transmitter for transmitting a coded signal, the transmitter comprising timer means for supplying a timing signal; first low frequency oscillator means and second low frequency oscillator means coupled to said timer means and responsive to its output for generating respectively a first low frequency signal and a second low frequency signal, the second low frequency signal being of a lower frequency than the first low frequency signal; means for frequency modulating said first low frequency oscillator means with the second low frequency signal; and radio frequency signal means coupled to said first low frequency oscillator means and responsive to its frequency modulated output signal for producing an intermittant radio frequency output modulated by the frequency modulated output signal wherein said radio frequency signal means is a radio frequency oscillator.

4,399,439
SIGNAL SWITCHING MATRIX

Lakshminarashimha C. Upadhyayula, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,027
Int. Cl.³ H04Q 9/00; H03K 11/60
U.S. Cl. 340—825.91 12 Claims



1. An M by N signal switching matrix for coupling various ones of N input lines to various ones of M output lines comprising in combination:

N single-pole, M-throw input switches coupled to said N input lines where each of said switches has M outputs;

M N-throw, single-pole output switches coupled to said M output lines where each of said output switches has N inputs;

M*N connections between respective ones of the M outputs of the N input switches and respective ones of N inputs to the M output switches where M and N are integers, M<=>N and * is the multiplication symbol.

4,399,440
ADDRESSABLE TRANSDUCER WITH A VARIABLE FREQUENCY OSCILLATION FOR MONITORING A PHYSICAL QUANTITY

Norman F. Douglas, Albuquerque, N. Mex., assignor to Sparton Corporation, Jackson, Mich.

Filed Feb. 17, 1981, Ser. No. 235,349
Int. Cl.³ G08C 19/16, 19/04
U.S. Cl. 340—870.26 5 Claims

1. An addressable transducer for use in a monitoring system of the type including a central station and multiple addressable transducers for monitoring the value of selected physical conditions, at multiple locations with one of said transducers at each of said multiple locations,

said system being characterized by a single pair of transmission lines extending from the central station to all of said multiple locations and having a voltage thereon which is modulated at controlled intervals to produce successive address signals for selectively addressing one of the multiple transducers to obtain a data signal therefrom,

said transducer comprising:

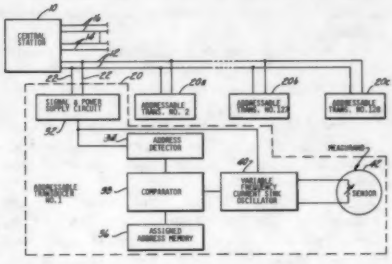
an address detector coupled with said pair of lines and

adapted to produce a control signal in response to a predetermined address signal,

a current sink oscillator having a frequency determining circuit for determining the oscillator frequency and being adapted to oscillate in response to application of an operating voltage,

a sensor including a condition responsive impedance element coupled with said frequency determining circuit and adapted to modify said oscillation frequency according to variations in value of a selected physical condition,

a voltage supply circuit coupled with said current sink oscillator for supplying an operating voltage thereto, and



switching means for operatively coupling said voltage supply circuit to said pair of lines for deriving an operating voltage therefrom,

said switching means being responsive to said control signal for coupling said voltage supply circuit to said pair of lines,

whereby said current sink oscillator draws current from said pair of lines, said current having an undulating amplitude at the frequency of the oscillator whereby the frequency of the undulating current in said lines at said central station corresponds to the value of said physical condition.

4,399,441

APPARATUS FOR REMOTE TEMPERATURE READING

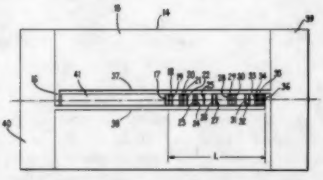
Richard Vaughan, Maroubra, and Peter H. Cole, West Lakes, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Jan. 19, 1981, Ser. No. 226,518

Claims priority, application Australia, Jan. 25, 1980, PE2148

Int. Cl.³ G01S 9/56, 13/74

U.S. Cl. 343—6.5 SS **5 Claims**



1. Apparatus for remote temperature reading comprising transmitter means for transmitting electro-magnetic signals, label means adapted for attachment to or implantation in an article or animal for receiving a signal transmitted from said transmitter means and for retransmitting a reply, and receiver means for receiving and processing the reply; said label means including antenna means for receiving said transmitted signal, transducer means for converting said electromagnetic signal to a surface acoustic wave, a path on said label over which said surface acoustic wave travels, the time of travel of said surface acoustic wave over said path being a function of the temperature of the path, the same or further transducer means being arranged to convert said surface acoustic wave to a first electromagnetic signal after it has travelled over a first part of said path and to feed said signal to said antenna means for retransmission to said receiver means and thereafter to convert said surface acoustic wave to a second electromagnetic signal after it has travelled over a second part of said path and to feed said second electromagnetic signal to said antenna means for retransmission to said receiver means, said receiver means including circuitry for measuring the time interval between said first and second electromagnetic signals resulting from the passage of said surface acoustic wave over said path and for providing from said measured time interval an output indicative of the temperature of the environment of the label means.

4,399,442

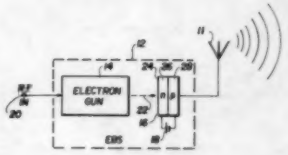
ACTIVE TRANSMITTING ANTENNA EMPLOYING AN ELECTRON BEAM BOMBARDED SEMICONDUCTOR

Charles M. DeSantis, Neptune, and Robert M. True, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 6, 1981, Ser. No. 280,562

Int. Cl.³ G01S 3/38

U.S. Cl. 343—100 SA **4 Claims**



1. A low profile, hybrid high power VHF antenna efficiently matched over a 30 MHZ to 1 GHZ band without adjustment, comprising:

a folded monopole antenna having an electrical length which is not more than 0.15 wavelength of its operating frequency having one end thereof electrically connected to a ground plane;

means for feeding and matching said antenna comprising a common vacuum envelope enclosing respectively; an EBS diode having p-layer electrically connected to said antenna and n-layer electrically connected to the said ground plane, the EBS diode being electrically coupled to an external electrical bias means; a source of electrons; and a modulation means positioned between said source and said EBS diode for modulating streams of electrons emanating from said source and striking a surface of said EBS diode, whereby a signal for transmission on the antenna is fed to the said modulation means; and, the said bias means is preadjusted so that the reactive impedance of the EBS diode will equally cancel the reactive impedance of the said antenna at a select midband frequency, for efficient wideband matching with no further adjustment.

4,399,443

INK COMPOSITION AND METHOD FOR INK JET RECORDING

Yoshitaka Yasufuku; Yoshio Takeuchi, and Yoshiaki Kimura, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 336,026

Claims priority, application Japan, Jan. 14, 1981, 56-3239; Apr. 10, 1981, 56-54028

Int. Cl.³ G01D 15/16

U.S. Cl. 346—1.1 **20 Claims**

1. An ink composition for ink jet recording, which comprises a colouring agent and additives which are adjusted to

bring the roundness (D) of dots formed on a recording paper of from 50 to 80 g/m^2, to be at least 0.75 where said roundness (D) is represented by the formula

$$D=4\pi\times S/L^2$$

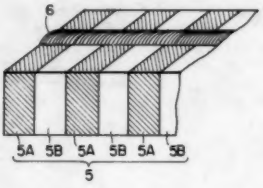
where S is an area of each dot, L is a length of the circumference of the dot and π is the circular constant.

4,399,444

HEAT-SENSITIVE RECORDING HEAD

Haruhiko Moriguchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,352
Claims priority, application Japan, Dec. 19, 1980, 55-178920
Int. Cl.^{3} G01D *15/10*
U.S. Cl. 346—76 PH **8 Claims**



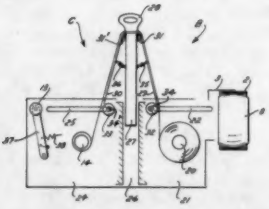
1. A thermal recording head of the type including at least one resistive element having first and second electrodes connected thereto for providing current through said resistive element to thereby generate heat, said recording head comprising conductive and insulating layers alternately laminated by a chemical vapor deposition process, or the like, to form a laminated body, said laminated body having a side surface extending in a direction not parallel to the planes of said layers; and said resistive element comprising a resistive material extending along said side surface and in contact with each of said conductive layers.

4,399,445

RECORDER FOR AN UNDERWATER DETECTION SYSTEM

Yuji Sato, and Shoji Koizumi, both of Kobe, Japan, assignors to Furuno Electric Co., Ltd., Nishinomiya, Japan

Filed Oct. 17, 1980, Ser. No. 198,033
Claims priority, application Japan, Oct. 30, 1979, 54-140922; Oct. 30, 1979, 54-140924; Oct. 30, 1979, 54-140925
Int. Cl.^{3} G01D *15/24*
U.S. Cl. 346—136 **37 Claims**



1. A recorder having a feed member and a take-up member positioned under stretched recording paper extending about a supporting member with a curved surface and a roller, the recording paper drawn out of a paper roll mounted on the feed member, progressively passing over the supporting member, the roller and being wound onto the take-up member, and the recorder having at least one recording means moving across the width of the recording paper, the improvments characterized by means for holding and simultaneously moving the supporting member and the roller so that at least one of the feed member and the take-up member can be removed and installed in the recorder from the upper side of the stretched recording paper,

in which the holding and moving means comprises:

(i) a vertical guide opening,

(ii) a supporting member adapted to be moved in said vertical guide opening,

(iii) a first supporting means connected to one side of the upper portion of said supporting member at one end thereof by a coupling means and connected to the supporting member with the curved surface at the other end thereof,

(iv) a second supporting means connected to the other side of the upper portion of said supporting member at an end thereof by a coupling means, for supporting the roller at the other end thereof,

(v) horizontal openings formed in vertical plates disposed perpendicularly to the recording means scan and adjacent to the side of said first and second supporting means respectively, and

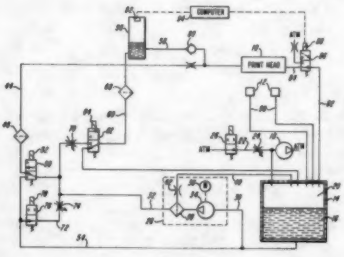
(vi) pins fixed to at least one of the ends of the supporting member with the curved surface, the roller on said supporting member, and appropriate points on the sides of at least one of said first and second supporting means.

4,399,446

INK SUPPLY SYSTEM FOR AN INK JET PRINTER

James D. McCann, Waynesville; Theodore F. Williams, Beavercreek, and John D. Vogel, Sagamore Hills, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 18, 1982, Ser. No. 340,136
Int. Cl.^{3} G01D *15/18*
U.S. Cl. 346—140 R **12 Claims**



1. An ink supply system for supplying ink to the print head of an ink jet printer for production of jet drop streams, comprising:

an ink supply tank for storing a quantity of ink,

pump means, having a pump inlet and a pump outlet, for receiving ink from said ink supply tank at said pump inlet and for providing ink under pressure at said pump outlet,

print head supply line means for providing flow of ink from said pump outlet to said print head,

closed container means communicating with said pump outlet, said ink supply tank, and said print head for holding a quantity of ink therein for providing a second flow of ink to said print head at a static pressure that increases with time,

controllable valve means for selectively directing ink from said pump outlet to said closed container means, and

means for controllably actuating said controllable valve means such that a portion of the ink from said pump outlet is directed to said closed container means, gradually compressing the air within said closed container means as said

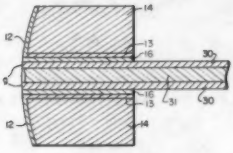
container means is filled with ink and thereby supplying the ink therefrom to said print head at a static pressure increasing with time.

4,399,447

WEAR RESISTANT ELECTRODE HEAD FOR ELECTROGRAPHIC PRINTERS

Kishor M. Lakhani, and Jerry L. Ligon, both of Oklahoma City, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 4, 1981, Ser. No. 259,889
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **7 Claims**



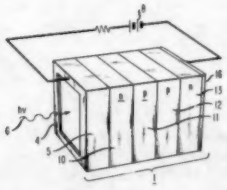
1. An electrode head assembly for use in electrographic printing comprising a first subassembly of polyimide fiberglass substrate having intimately bonded thereon a plurality of rhodium-plated copper styli; a second subassembly comprising at least two metal head bars, each head bar having six faces with a first face of each head bar having a thin layer of molybdenum bonded thereon and a second face of each head bar at right angles to said first face having alumina bonded thereon; said first subassembly being sandwiched between the alumina faces of each metal head bar and intimately bonded thereto, thus resulting in said electrode head assembly having the molybdenum coated face as the crown face.

4,399,448

HIGH SENSITIVITY PHOTON FEEDBACK PHOTODETECTORS

John A. Copeland, III, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 2, 1981, Ser. No. 230,873
Int. Cl.³ H01L *29/161, 33/00, 27/14*
U.S. Cl. 357—19 **8 Claims**



1. An optoelectronic device comprising a substrate and at least four abutting layers of semiconductor material grouped into a sequence of pairs of layers, each pair being arranged as a first layer and a second layer, the substrate abutting one layer of the pairs of layers and being comprised of a semiconductor material having a similar conductivity type to that of the abutting layer of the pairs of layers,

electrode means for applying a bias potential across the sequence of pairs of layers,

the first layer of each pair being composed of semiconductor material having a conductivity type opposite to that of the second layer in the corresponding pair, the first and second layers within each pair having substantially equal bandgaps,

the first layer of each pair in the sequence of pairs being comprised of similar conductivity type semiconductor material to the second layer of each immediately adjacent pair of layers, and the bandgap of the first layer of each pair being substantially dissimilar to the bandgap of the second layer of each immediately adjacent pair,

characterized in that

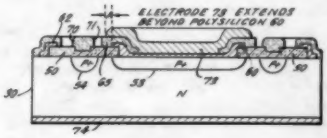
a reflective coating layer abuts an outermost layer of the sequence of pairs of layers.

4,399,449

COMPOSITE METAL AND POLYSILICON FIELD PLATE STRUCTURE FOR HIGH VOLTAGE SEMICONDUCTOR DEVICES

Thomas Herman, Redondo Beach, and Alexander Lidow, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 17, 1980, Ser. No. 207,124
Int. Cl.³ H01L *29/40*
U.S. Cl. 357—53 **16 Claims**



1. A semiconductor device having a composite field plate; said semiconductor device comprising a body of semiconductor material having at least a first generally flat surface; at least one P-N junction formed in said first surface and terminating on said first surface wherein said first surface is P type on one side of said P-N junction and N type on the other side of said P-N junction; a first insulation layer on said first surface and extending over at least a part of said P-N junction; a layer of polysilicon of relatively high conductivity having a first body portion galvanically connected to said first surface on only one of said sides of said P-N junction; said layer of polysilicon having a second body portion continuous with said first portion, which said second portion is stepped up from said first surface and overlies and is supported by the upper surface of said first insulation layer; said second body portion terminating on an edge; a second insulation layer extending from an edge overlying said first body portion of said layer of polysilicon and extending to and overlying at least portions of said second body portion of said layer of polysilicon and extending across said edge of said layer of polysilicon; and a contact metal layer overlying said layer of polysilicon and overlying said second insulation layer and extending beyond said edge of said polysilicon; said composite polysilicon and said contact metal layer in surface-to-surface contact with one another only in areas on one side of said edge of said second insulation layer to define a double stepped field plate extending beyond the region of galvanic contact to said first surface by said polysilicon to reduce the curvature of the electric field equipotential lines within said body of semiconductor material during reverse bias of said P-N junction.

4,399,450
ROM WITH POLY-SI TO MONO-SI DIODES

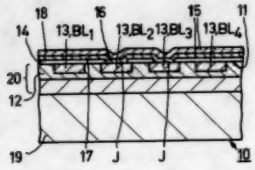
Jan Lohstroh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 957,628, Nov. 3, 1978. This application Dec. 22, 1980, Ser. No. 219,059

Claims priority, application Netherlands, Nov. 28, 1977, 7713051

Int. Cl.³ H01L 27/04; G11C 17/06

U.S. Cl. 357—59 7 Claims



1. A semiconductor device having a permanent memory, comprising:

a semiconductor body having a surface-adjoining surface region of mainly a first conductivity type;

a number of juxtaposed, parallel strip-shaped surface zones of the second conductivity type provided on said region;

said surface being covered with an insulating layer;

a number of juxtaposed, parallel strip-shaped conductor tracks provided on said insulating layer which cross said strip-shaped surface zones;

said conductor tracks at the area of the crossings being connected to said strip-shaped zones by a rectifying junction through windows in said insulating layer depending on the information stored in the memory, characterized in that,

at least parts of said conductor tracks are formed by semiconductor material deposited at least on the surface of said semiconductor body in the windows, which material is of the first conductivity type opposite to the conductivity type of said strip-shaped zones, forming said rectifying junctions at the area of said windows in the form of p-n junctions,

said semiconductor material deposited in said window having a polycrystalline structure;

the doping concentration of the deposited semiconductor material being lower than the surface concentration of said strip-shaped zones in said semiconductor body.

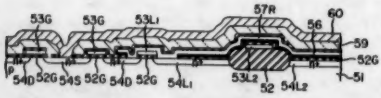
4,399,451
SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCTION THEREOF

Kazunari Shirai, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 30, 1980, Ser. No. 221,371

Int. Cl.³ H01L 29/04, 27/02

U.S. Cl. 357—59 7 Claims



1. A semiconductor device comprising:

a semiconductor substrate having regions with a high impurity concentration selectively located therein,

a first insulator layer formed on said substrate to selectively cover said regions of said substrate,

a highly doped first polycrystalline semiconductor layer formed selectively on said first insulator layer,

a second insulator layer selectively covering said first polycrystalline semiconductor layer, and

a second polycrystalline semiconductor layer selectively covering said first and second insulator layers, and selectively contacting parts of the first polycrystalline semiconductor layer and of said substrate regions, at least one of said parts of the first polycrystalline semiconductor layer being located contiguously to at least one of said substrate regions,

wherein said second polycrystalline semiconductor layer is more heavily doped where it is in contact with said substrate regions and said first polycrystalline semiconductor layer, due to upward diffusion of impurites from said substrate regions and said first polycrystalline semiconductor layer, and

wherein said first polycrystalline semiconductor layer comprises electrodes and wirings, and said second polycrystalline semiconductor layer comprises resistor elements overlying at least in part said substrate regions.

4,399,452
EXPLOSION-PROOF SEMICONDUCTOR DEVICE

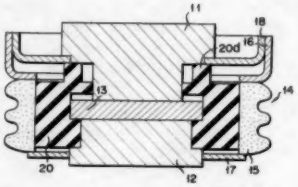
Kazuyuki Nakashima, Tokyo; Youichi Araki, Kawasaki; Yukio Igarashi, Yokohama, and Shinjiro Kojima, Chigasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1980, Ser. No. 181,652

Claims priority, application Japan, Aug. 31, 1979, 54-110354

Int. Cl.³ H01L 23/10, 23/24

U.S. Cl. 357—74 12 Claims



1. A semiconductor device comprising:

(a) a semiconductor element formed substantially in the shape of a disc;

(b) first and second electrodes for sandwiching therebetween said semiconductor element,

said first electrode including a first cylindrical portion having a flat first surface contacting said semiconductor element and a second cylindrical portion, integrally formed with said first cylindrical portion and having a diameter larger than the diameter of said first cylindrical portion, said second cylindrical portion further having a flat second surface extending in a radial direction beyond the circumference of said first cylindrical portion,

said second electrode also including a flat surface contacting said semiconductor element and a cylindrical portion;

(c) a housing forming an airtight chamber with said first and second electrodes and enclosing said semiconductor element; and

(d) an explosion-proof member for absorbing a force produced by an explosion of said semiconductor element, disposed within said housing and enclosing said semiconductor element, said explosion-proof member including

a central annular portion having an inner diameter not smaller than the diameter of said semiconductor element,

a first annular portion integral with one end of the central

annular portion and having an inner surface contacting the first cylindrical portion of said first electrode and a flat surface parallel to the flat second surface of said first electrode, and further having at least a first annular projection integrally formed on the flat surface of the first annular portion and extending in the axial direction of the first annular portion at least partially above the flat surface of the first annular portion, said projection having a surface pointing towards the radially extending flat second surface of the second cylindrical portion of said first electrode, and

a second annular portion integral with the other end of the central annular portion and having an inner surface contacting the cylindrical portion of said second electrode.

4,399,453

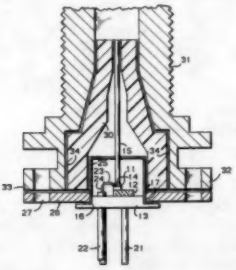
LOW THERMAL IMPEDANCE PLASTIC PACKAGE

Howard M. Berg, Scottsdale; Gary L. Lewis, Peoria, and Curtis W. Mitchell, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1981, Ser. No. 246,506

Int. Cl.³ H01L *23/02, 27/14, 33/00*

U.S. Cl. 357—81 **7 Claims**



1. A fiber optic semiconductor device having a low thermal impedance comprising:

a thermally conductive header;

a semiconductor chip, having a photo-active area, thermally connected to said header;

a segment of fiber optically connected to said photo-active area; and

heat spreader means thermally coupled to said header, said heat spreader means extending outwardly from said header for conducting heat away from said semiconductor chip;

a cylindrical, thermally conductive member orthogonal to and thermally connected to said heat spreader; and

plastic enclosure means engaging said heat spreader for enclosing said semiconductor chip, said cylindrical member, and said fiber, said fiber extending through a surface of said enclosure means, and wherein said cylindrical member conducts heat away from said semiconductor chip through said enclosure means.

4,399,454

DIGITAL COMB FILTERING FOR PAL TELEVISION SIGNALS

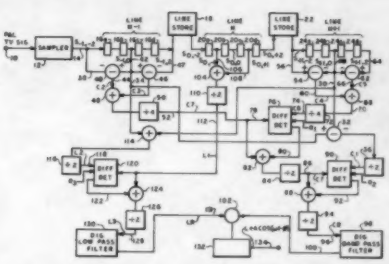
Richard B. Warnock, Bountiful, and Leonard J. Brugger, Holladay, both of Utah, assignors to Fernseh Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 49,221, Jun. 18, 1979, abandoned. This application Jul. 16, 1980, Ser. No. 170,310

Claims priority, application European Pat. Off., Jun. 17, 1980, 80103360.6; Japan, Jun. 17, 1980, 55-82064

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—16 **21 Claims**



1. A method of correcting the phase of the chroma component of a reference picture element in a reference video frame of a PAL type television signal, comprising:

(a) sampling the television signal at a rate corresponding to N times the chroma subcarrier frequency of the television signal, where N is an even integer, thereby to generate a series of digital signals each associated with a discrete picture element and each representative of the amplitude of the luminance component and amplitude and phase of the chroma component of its associated picture element;

(b) storing the digital signals associated with the picture elements of a reference line (n) of a reference frame of the television signal, and storing the digital signals associated with the picture elements in lines (n+1) and (n−1) immediately preceding and following the reference line (n), respectively; and

(c) combining and averaging stored digital signals associated with selected picture elements in at least one of the lines (n−1) and (n+1) such that the resultant chroma signal is substantially free of luminance components and has substantially the same amplitude and phase as that of a picture element which is in the next successive frame immediately following the reference frame and whose location corresponds to the location of the reference picture element,

whereby the amplitude and phase of the chroma components of correspondingly located picture elements in successive frames are rendered substantially the same for comparison with each other.

4,399,455

TELEVISION VIEWER

Luis W. Alvarez, 131 Southampton Ave., Berkeley, Calif. 94707

Continuation-in-part of Ser. No. 56,035, Jul. 9, 1979, abandoned, and a continuation-in-part of Ser. No. 128,641, Mar. 10, 1980, Pat. No. 4,301,468. This application Jun. 18, 1981, Ser. No. 274,760

Int. Cl.³ H04N *9/31*

U.S. Cl. 358—60 **12 Claims**

1. A viewing system for use by a single viewer of a single electronic display comprising a projection lens having an aperture, a limited, light diverging screen viewed by the viewer, the screen having a Fresnel lens means incorporated therein with a front face and a rear face which optically faces the projection lens, wherein the projection lens projects the light image from the single electronic display onto the Fresnel lens means, the Fresnel lens means comprising a first set of parallel,

straight lens Fresnel lens elements on the rear face and a second set of parallel, straight line Fresnel lens elements on the front face which are arranged orthogonal to the first elements, at least some of said first and second elements being contoured to act as a combined simple field lens for focusing an image of the projection lens aperture at an exit pupil located at a predetermined viewing distance from the screen while simultaneously spreading the image over an oval shaped area having predetermined minor and major axial dimensions and which is contained in a plane, parallel to the screen and located at the predetermined viewing distance from the screen, with substantially all of the light image passing through the projection lens hitting the exit pupil.

4,399,456

THREE-DIMENSIONAL TELEVISION PICTURE DISPLAY SYSTEM AND PICTURE PICK-UP DEVICE AND PICTURE DISPLAY DEVICE SUITABLE THEREFOR

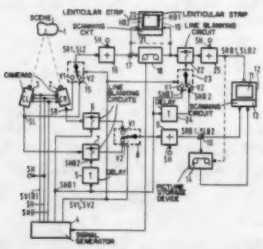
Peter C. Zalm, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1981, Ser. No. 304,540

Claims priority, application Netherlands, Oct. 14, 1980, 8005650

Int. Cl.³ H04N 9/54

U.S. Cl. 358—92 **7 Claims**



1. A three-dimensional television picture display system comprising a picture pick-up device and a picture display device having a picture display screen and scanning means for performing, in scanning periods and with blanking periods, a periodic scanning operation of the screen at line and field frequency for generating on the screen a picture corresponding to the original scene recorded with the pick-up device, information which is intended for the right and for the left-eye, respectively, of an observer being present in this picture in first and second images, respectively, the images being shifted in the direction of line scan, which, for an entire, image information-separated observation with two eyes, results in a three-dimensional picture, characterized in that said system further comprises means for shifting the periodic line blanking of the second image relative to the periodic line blanking of the first image in the direction of line scan.

4,399,457

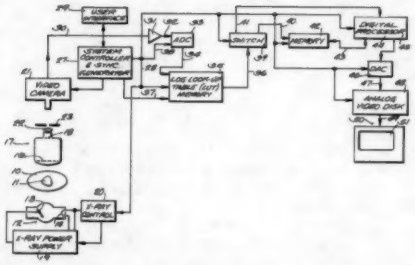
X-RAY IMAGE DIGITAL SUBTRACTION SYSTEM

Stephen J. Riederer, Wauwatosa; Gary S. Keyes, Hartland, and Barry N. Stone, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,291

Int. Cl.³ H04N 7/18

U.S. Cl. 358—111 **6 Claims**



1. A digital fluoroscopy system comprising:

means including an x-ray source for producing consecutive x-ray images of an anatomical region,

means including video camera means for converting the image to analog video signals which vary in magnitude in correspondence with variations in brightness of the picture elements (pixels) which compose the image and are within a range defined between black and white,

analog-to-digital converter means having input and output means, said converter means being operative to convert successive picture element samples of analog video signals fed to its input means to corresponding digital values represented by a predetermined number of bits and appearing on its output means, said digital values constituting digital addresses,

memory means having address input means and having output means, said memory means having stored in it digital pixel signals representative of the logarithms, respectively, of the digital values in a range whose minimum value is higher by a predetermined amount than the value that corresponds to black and whose maximum value is substantially equal to a value that corresponds to white in the image and in the analog video signal, said digital pixel signals representative of the respective logarithms of the digital values being located in said memory at addresses corresponding to the value so that when a digital pixel value is fed from said analog-to-digital converter means to the memory input means a digital signal corresponding to the logarithm of the values appears on said output means,

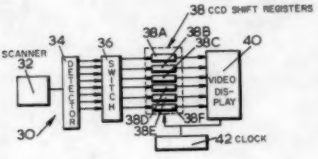
means for processing the logarithmic digital pixel signals including means for subtracting the pixel signals representative of different images and means for converting signals resulting from subtraction to analog video signals, and

television means responsive to input of the last-named analog signals by displaying a visual image representative of the difference between the x-ray images.

4,399,458
SIGNAL PROCESSING SYSTEM

Peter J. Berry, Glasgow, and John Y. C. Montgomery, Edinburgh, both of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed May 18, 1981, Ser. No. 264,831
Claims priority, application United Kingdom, May 22, 1980, 8017014
Int. Cl.³ H04N 5/197
U.S. Cl. 358—113 4 Claims

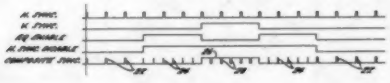


1. A signal processing system comprising an analogue shift register of the charge coupled type, clock means arranged for clocking samples of an input signal into the CCD shift register, for determining the storage time of the signal in the CCD shift register, and for clocking the signal out of the CCD shift register, wherein the number of samples of the input signal is less than the number of sites in the CCD shift register and during the storage time the clock means is arranged to clock the stored samples through at least some of the register sites unfilled during the clocking in period.

4,399,459
FLEXIBLE VIDEO SYNCHRONIZATION CIRCUIT

Patrick Mulvanny, Evanston, and Scott Bartky, Chicago, both of Ill., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Oct. 30, 1981, Ser. No. 316,736
Int. Cl.³ H04N 5/06
U.S. Cl. 358—150 9 Claims



1. A circuit for accepting a horizontal frequency input signal and a vertical frequency input signal and generating a combined video synchronization signal, comprising, in combination:

(a) a phase-locking means having an input accepting the horizontal frequency input signal for generating a plurality of phases at the horizontal frequency;

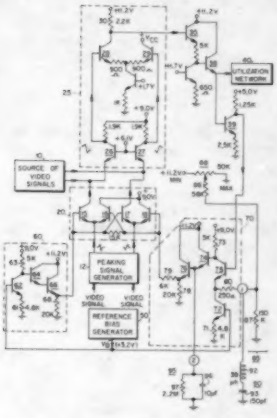
(b) delay means for receiving the vertical input frequency and having outputs providing consecutive early, current, and late vertical sync pulses; and

(c) a combinatorial logic means, having combinatorial logic gates with inputs accepting a plurality of the phases at the horizontal input frequency and the consecutive early, current, and late vertical sync pulses, for generating a composite video synchronization signal having both the horizontal and the vertical synchronization frequencies, and having only one phase of the horizontal input frequency in the absence of the consecutive early, current, and late vertical sync pulses, and having at least two phases of the horizontal input frequency during the consecutive early and late vertical sync pulses, so that a composite video synchronization signal is generated having horizontal pulses, serrated vertical pulses, and equalization pulses at twice the horizontal frequency preceding and following the serrated vertical pulses.

4,399,460
VIDEO SIGNAL PEAKING CONTROL SYSTEM WITH PROVISION FOR AUTOMATIC AND MANUAL CONTROL

Leopold A. Harwood, Bridgewater, N.J.; Robert L. Shanley, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,139
Int. Cl.³ H04N 5/14, 5/52; H03K 1/00
U.S. Cl. 358—166 12 Claims



1. Apparatus for automatically and manually controlling the high frequency peaking content of a video signal, comprising:

peaking means responsive to said video signal for generating an output peaking component, said peaking means providing controllable amount of said output peaking component in response to a peaking control voltage;

means for combining said video signal with said peaking component to produce a peaked video signal;

control means responsive to said video signal and providing said peaking control voltage to said peaking means;

filter means coupled to said control means for shaping the frequency response of said control means such that, in an automatic peaking control mode, said control voltage is a function of the magnitude of video signal high frequency components within a given frequency range; and

manually adjustable peaking control means coupled to said control means for controlling the conduction of said control means such that, in a manual peaking control mode, said control voltage is a function of the setting of said manually adjustable peaking control means; and wherein

said filter means and said manually adjustable peaking control means are interconnected and coupled to said control means via a single common terminal.

4,399,461
ELECTRONIC IMAGE PROCESSING

Philip G. Powell, Pinner, England, assignor to Eastman Kodak Company, Rochester, N.Y.

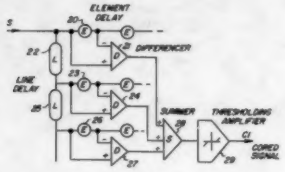
Continuation of Ser. No. 192,954, May 28, 1980. This application Mar. 12, 1982, Ser. No. 357,357
Claims priority, application United Kingdom, Sep. 28, 1978, 38546/78
Int. Cl.³ H04N 5/14; G06K 9/56
U.S. Cl. 358—166 12 Claims

1. An electronic filter responsive to a plurality of brightness

signals for generating a filtered image signal representative of an enhanced image, said brightness signals corresponding to a predetermined array of elements of an image, said filter comprising:

means responsive to the brightness signals for generating a first gradient signal;

means responsive to the brightness signals for generating a



second gradient signal which is inverted and delayed by a time corresponding to at least one image element with respect to said first gradient signal;

means for modifying at least one of said first and second gradient signals; and

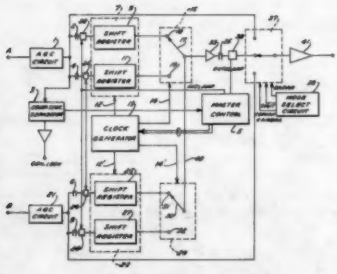
means for combining said first and second gradient signals after such modification to generate the filtered image signal.

4,399,462

VIDEO SPLIT SCREEN TECHNIQUE

Harvey L. Balopole, Whitestone, and Thomas H. Traynor, Lindenhurst, both of N.Y., assignors to Fairchild-Weston Systems Inc., Syosset, N.Y.

Filed Jan. 30, 1981, Ser. No. 230,182
Int. Cl.³ H04N 5/22
U.S. Cl. 358—183 **11 Claims**



1. Apparatus for producing a simultaneous display of juxtaposed pictures of two independently derived images on a raster scan television monitor comprising:

a. first and second analog memory means for storing analog video signals representative of substantially all of each of said images;

b. first timing means coupled to said first and second analog memory means for storing said video signals at a given frequency and for retrieving said stored analog video signals at a frequency higher than said given frequency; and

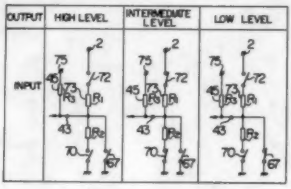
c. means for combining the outputs of said first and second analog memory means to juxtapose the pictures represented by the video signals stored in each analog memory on said television monitor.

4,399,463

SIGNAL DETECTOR CIRCUIT

Kazumi Kawashima, Takatsuki, and Masaaki Fujita, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 27, 1981, Ser. No. 315,455
Claims priority, application Japan, Oct. 29, 1980, 55-152915
Int. Cl.³ H04N 5/50
U.S. Cl. 358—191.1 **2 Claims**



1. A signal detector circuit comprising: means for comparing a detection output for automatic frequency control with first to fifth levels respectively, wherein with a result that a low-level output is produced when said detection output is lower than said fifth level, an intermediate-level output is produced when said detection output is between said fourth and fifth levels, a low-level output is produced when said detection output is between said third and fourth levels, a high-level output is produced when said detection output is between said second and third levels, an intermediate-level output is produced when said detection output is between said first and second levels, and a high-level output is produced when said detection output is higher than said first level, an intermediate-level output being produced in the absence of a signal;

a series circuit of a first switching element and a first resistor inserted between an output terminal and a power terminal for said comparison means;

a third switching element connected in parallel to a series circuit of a second switching element and a second resistor, said parallel circuit being inserted between said output terminal and the ground; and

a third resistor inserted between said output terminal and a power supply terminal of an external circuit for receiving the output of said comparator circuit,

wherein said first, second and third switching elements being all opened when said comparing means produces said high level output, said first and second switching elements are selectively closed when said comparator circuit produces said intermediate-level output, said third switching element being selectively closed when said comparing means produces said low-level output.

4,399,464

SIGNAL PROCESSOR FOR AN ARRAY OF CID RADIATION DETECTOR ELEMENTS

Rudolf G. Hix, Diamond Bar, and Allen A. Bojorquez, Placentia, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

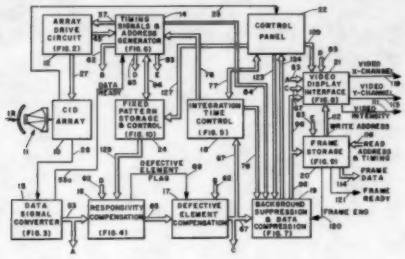
Filed May 4, 1981, Ser. No. 259,862
Int. Cl.³ H04N 3/14, 5/33
U.S. Cl. 358—213 **22 Claims**

1. A signal processor for an array of charge injection device (CID) radiation detector elements, comprising

drive means for driving the elements to the array to produce a stream of individual data signals from the respective detector elements of the array by providing a combination of address signals for individually addressing each detector element and timed drive signals for sequentially clearing and reading data from the addressed detector elements, wherein the magnitude of each data signal is pro-

portional to the amount of radiation stored as charge in the addressed detector element over an integration time between said sequential drive signals for clearing and reading data from the detector element; and

integration time control means coupled to the array for measuring the magnitude of the data signals in relation to the saturation thresholds of the detector elements, and



coupled to the drive means for controlling the combination of address signals and timed drive signals in response to said measurements to vary the integration times for the detector elements so as to maintain the amount of radiation stored in a predetermined percentage of the detector elements within a predetermined operating range below their saturation thresholds to thereby increase the effective dynamic range of the detector array.

4,399,465

SYSTEM FOR SCANNING OF MOTION PICTURE FILMS TO DERIVE TELEVISION SIGNALS

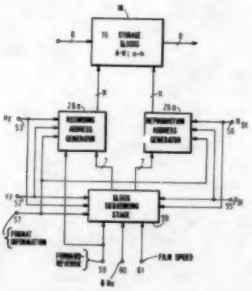
Volker Massmann, Mühltal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,673

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039211

Int. Cl.³ H04N *5/36*

U.S. Cl. 358—214 **10 Claims**



1. System for scanning of film to derive standard television signals in which the film is scanned line-by-line without interlace, having

a storage means (**16**) for storing signals connected to receive scanned signals derived from scanning of the film, line by line,

recording address generating means (**26***a*) for generating specified addresses for control of the storage means, and connected to the storage means, the scanned signals being stored in the storage means at specified addresses under control of the recording address generating means;

reproduction address generating means (**26***b*) for generating specified addresses for additional control of the storage means, and connected to the storage means, the stored signals being read-out from specified addresses under control of the reproductive address generating means in accordance with television (TV) transmission standards, including line and frame frequency;

and wherein, upon scanning film of normal or Cinemascope format, and to derive signals for a 525 line/60 Hz interlace television standard, the storage means (**16**) comprises

sixteen storage blocks (A–H; a–h) divided into two groups of eight blocks each, each block being capable of storing thirty-six lines of scanned signals corresponding to thirty-six lines;

the recording address generating means controlling storage of the scanned signals in a predetermined sequence of an odd number of blocks of the two groups, and wherein the sequence, with respect to sequentially scanned sets of thirty-six lines, changes with succeeding film frames, the sequence repeating in cycles of four succeeding frames;

and wherein the reproduction address generating means controls read-out of the stored signals for, alternatingly, reading-out the storage blocks of one group first, then the storage blocks of the other group, and, with respect to every other film frame, the storage blocks of the first group are read-out once more after read-out of the second block, whereby the first and third frames will have the first group of storage blocks read-out twice, and the second group of storage blocks read-out once between the double read-out of the first storage blocks.

4,399,466

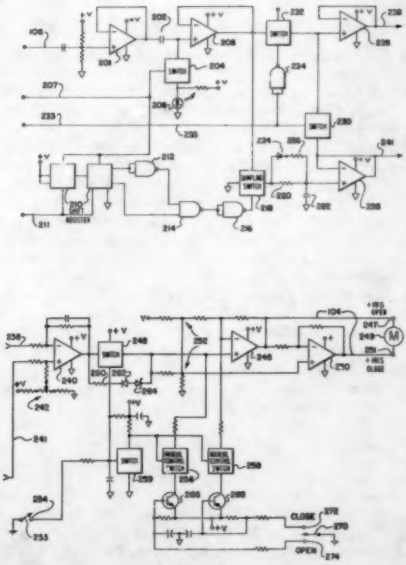
DARK CURRENT COMPENSATING LENS IRIS CONTROL

Donald L. Stephenson, Lancaster, Ohio, assignor to Calspan Corporation, Buffalo, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,298

Int. Cl.³ H04N *5/16, 5/193*

U.S. Cl. 358—228 **6 Claims**



1. A circuit for controlling the iris of a lens of a television camera in which said camera includes an optically black filter

covering selected horizontal beam scans of said camera, said circuit compensating for variations in dark current to control said iris in response to video signals including blanking portions from said camera independently of said variations in dark current and comprising:

sampling means for generating a dark current signal by sampling and storing the video signals from said camera during said selected horizontal beam scans;

compensating means coupled to said camera for generating a dark current compensated video signal by substituting said dark current signal for said blanking portions of said video signals; and

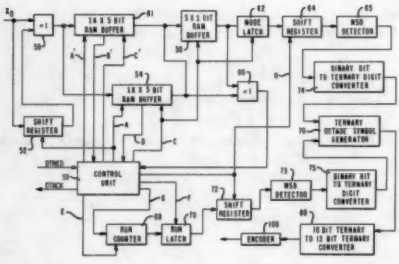
automatic iris control means responsive to said dark current compensated video signal for controlling said lens iris to maintain a defined magnitude video signal.

4,399,467

METHOD AND APPARATUS FOR IMAGE DATA COMPRESSION AND DECOMPRESSION

Ambati Subramaniam, Plano, Tex., assignor to NCR Canada Ltd., Mississauga, Canada

Filed Oct. 13, 1981, Ser. No. 310,017
Int. Cl.³ H04N *1/00*
U.S. Cl. 358—261 **27 Claims**



1. An apparatus for the processing of digital data derived from an image, comprising:

means for separating said digital data into a plurality of data bands, with each of said data bands comprising a predetermined number of scan lines from said image;

first means for generating a plurality of first symbols, with each of said first symbols representative of a binary value of a series of data bits contained within a specific bit position in each of said scan lines within said data band;

second means for generating a plurality of second symbols, with each of said second symbols representing a number indicative of consecutive occurrences of an associated first symbol;

third means for generating a plurality of third symbols, with each of said third symbols comprising a section of data representing a first symbol and a section of data representing a second symbol, where said second symbol is associated with said first symbol;

and means for generating a plurality of code words representative of each of said third symbols.

4,399,468

PRINTER

Sakuyuki Mizuno, Kunitachi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1981, Ser. No. 274,796
Claims priority, application Japan, Jun. 25, 1980, 55-86211
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—280 **11 Claims**

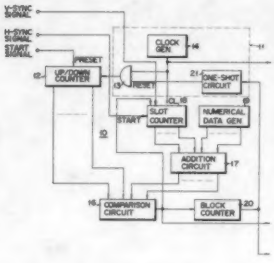
1. Apparatus for printing data contained in an input video signal asynchronously of said input video signal comprising:

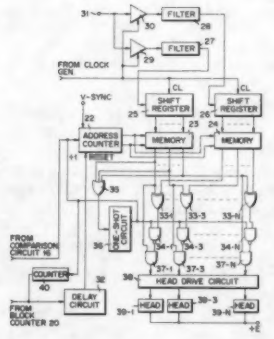
means for generating a sampling clock signal independently of said input video signal;

means for sampling said input video signal with said sampling clock signal;

first comparator means for providing a first pulse output when the level of the sampled input video signal is higher than a first reference level;

second comparator means for providing a second pulse output when the level of the sampled input video signal is higher than a second reference level which is lower than the first reference level;





means for separately memorizing the pulse outputs of said first and second comparator means;

means for reading out said first and second comparator means pulse outputs stored separately in said memorizing means and checking them with each other for each sampling; and

means for printing a regular thick black dot when said first and second comparator means pulse outputs are detected as a result of the checking and printing a thin gray dot when only the second comparator means pulse output is detected on a printing sheet.

4,399,469

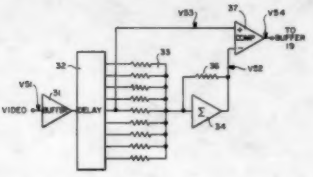
IMAGING SYSTEM AND METHOD WITH IMPROVED BOUNDARY DETECTION

Yung Lew, Huntington Beach, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 23, 1980, Ser. No. 142,974
Int. Cl.³ H04M *1/40*
U.S. Cl. 358—282 **8 Claims**

1. In a method for detecting a boundary between two areas of different color density in an object from an electrical signal representative of light reflected by the object from a beam of predetermined target area scanning across the object, the steps of: processing the electrical signal to provide an average color level signal corresponding to an average lever of color density

within the target area of the beam, sampling the electrical signal to provide a regional color level signal corresponding to the color level in a predetermined region of the target area,



comparing the regional color level signal with the average color level signal, and providing an output signal when the regional signal reaches a predetermined level relative to the average signal.

4,399,470

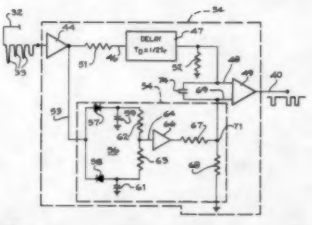
OPTICAL SCANNING SYSTEM

Earl R. Hibbard, 1718 Virginia St., Berkeley, Calif. 94703

Filed Apr. 27, 1981, Ser. No. 257,655

Int. Cl.³ H04M *1/00*

U.S. Cl. 358—284 **8 Claims**



1. In a system for optically scanning information to provide a digital representation of dark and light portions thereof, a video scanning system comprising a video camera of a type having means for sensing optical images projected thereon to provide a varying waveform in response to scanning dark and light portions of the optical images, circuit means providing a dynamic reference against which portions of the waveform can be compared to identify the waveform portions as representing dark or light portions of the images sensed, and means for representing the dark and light portions sensed as electric states representative of first and second binary digits respectively, said waveform including pulses of varying voltage, and in which said circuit means includes means for developing varying reference voltages with respect to said video waveform to be dynamically responsive to the waveform, the last named means being responsive to each said portion to develop a reference voltage associated with each and unrelated to the voltage of other said portions to cause the reference voltage to lie at a level intersecting the positive and negative slopes of each pulse substantially at a predetermined proportionate displacement therealong.

4,399,471

APPARATUS FOR RECORDING IMAGE INFORMATION AND SOUND RECORDINGS, PRESENTED AS ELECTRICAL INPUT SIGNALS, ON AN IMAGE RECORD PLATE

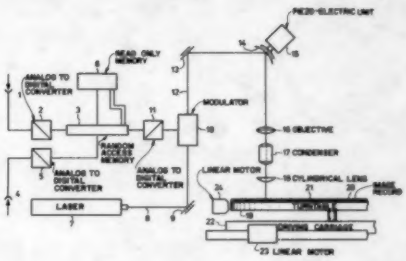
Heinz Preuss, Hanover, Fed. Rep. of Germany, assignor to BTS Systementwicklungs GmbH, Berlin, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,898

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949813

Int. Cl.³ H04N *1/22*; G11B *7/00*

U.S. Cl. 358—298 **11 Claims**



1. In an apparatus to record image information, presented as electrical input signals, as complete half-tone images in a spiral centered on a plate-shaped image record and to make sound redordings, from electrical input signals, presented as an optical sound track aligned with and adjoining the line of half-tone complete images, and furthermore to record optical control tracks for controlling playback of the record, such control tracks being adjacent to and aligned with the spiral of the half tone complete images,

said apparatus comprising in combination:

(1) a read only memory, an image sound line random access memory operatively associated therewith, in which, in a desired order and line-by-line, electrical input impulses, representative of the image and sound information, after undergoing analog to digital conversion, are recorded together with information, present in said read only memory, to form the said control tracks,

(2) a digital to analog converter, and operative associated therewith further including a laser for producing an output light beam, a modulator for modulating said light beam with information coming, after digital to analog conversion in said converter, from the image sound line random access memory, a sweep deflecting unit operatively associated with said laser and with which the modulated laser beam, on being deflected by said sweep deflecting unit is swept along a line on a light-sensitive layer at the time of recording, and an objective for focussing the said laser beam, and a record turntable, a carriage turningly supporting said record turntable, said turntable being arranged for supporting an image record having a light-sensitive layer, onto which the light beam, after being focussed in the objective, is pointed for the line-by-line recording of the information taken from the image sound line random access memory.

4,399,472

PHASE DIFFERENCE COMPENSATION BETWEEN SEPARATELY RECORDED LUMINANCE AND CHROMINANCE SIGNALS

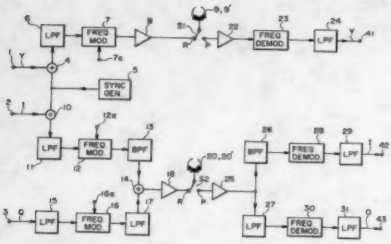
Katsuhiko Yamamoto, Neyagawa; Chojuro Yamamitsu, Kawanishi; Kunio Sekimoto, Katano, and Kozo Kurashina, Yawata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jun. 10, 1981, Ser. No. 272,372

Claims priority, application Japan, Jun. 11, 1980, 55-79549; Jul. 17, 1980, 55-98388

Int. Cl.³ H04N *9/44, 9/491*

U.S. Cl. 358—320 **11 Claims**



1. A color video tape recording and reproducing system comprising:

means including first and second video transducer heads for separately recording first and second signals of a color video signal with a timing signal interleaved with each of said first and second signals in alternate tracks of a recording medium and reproducing the recorded first and second signals and the recorded timing signals from said recording medium;

means for separating said timing signals from said reproduced first and second signals;

means for detecting a phase difference between said separated timing signals; and

means for delaying one of said reproduced signals relative to the other as a function of said detected phase difference to provide phase alignment between said reproduced signals.

4,399,473

APPARATUS FOR REPRODUCING VIDEO SIGNALS IN A SLOW-MOTION OPERATING MODE

Hiroyuki Kaimai; Masakazu Sonoda; Masaaki Komatsu; Atsuo Sakai, and Toshimitsu Kamai, all c/o Sony Corporation, 7-35 Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,396

Claims priority, application Japan, Jun. 23, 1980, 55-84851

Int. Cl.³ H04N *5/78;* **G11B** *21/04, 19/28*

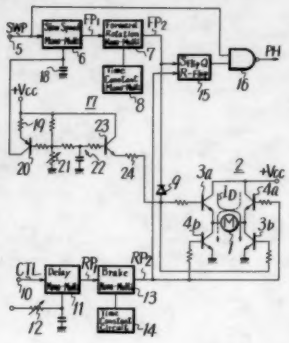
U.S. Cl. 360—10.3 **9 Claims**

1. An apparatus for reproducing video signals recorded on tracks which are obliquely formed on a tape comprising:

head means for scanning said tracks;

tape capstan motor means for driving said tape in a longitudinal direction of the latter;

tape driving means for generating a motor drive pulse, having a waveform shape as defined by a pulse width and a pulse amplitude, and a motor brake pulse which are applied to said tape capstan motor means and which respectively produced forward and reverse current flow through said tape capstan motor means effective for intermittently advancing said tape by an amount corresponding to a predetermined number of said tracks at time intervals which are determined in accordance with a selected slow-motion speed of advancement of said tape; and



compensating means for varying the waveform shape of said motor drive pulse in accordance with said selected slow-motion speed.

4,399,474

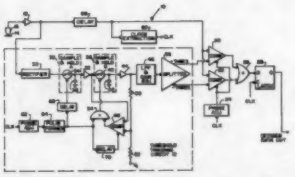
AUTOMATIC THRESHOLD TRACKING SYSTEM

Charles H. Coleman, Jr., Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 10, 1981, Ser. No. 292,657

Int. Cl.³ G11B *5/09, 5/02*

U.S. Cl. 360—46 **11 Claims**



209 369-337 Ikko 4,399,474 RE 12648

1. In an apparatus for decoding a partial-response signal whose level at a specified clock time represents one digital binary state if the level is more positive than a positive threshold level or more negative than a negative threshold level, and represents another digital binary state if the signal level is between said threshold levels, a system for automatically adjusting said positive and said negative threshold levels in proportion to variations in the overall amplitude of said partial-response signal, comprising:

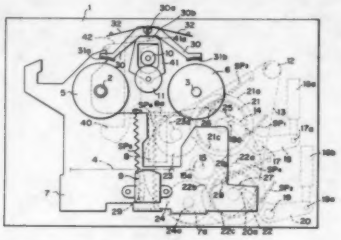
sample and hold means for generating an output signal whose amplitude is proportional to the absolute value of the level of said partial-response signal at said specified clock time when the level of the absolute value of said partial-response signal at said clock time is above a predetermined fraction of the absolute value of the level of said partial respone signal from a prior clock time, and for maintaining said output signal at the amplitude generated at a prior clock time when the level of the absolute value of the partial response signal at said specified clock time is below said predetermined fraction of the absolute value of the level of said partial response signal from said prior clock time; and

means for generating said positive and said negative threshold levels as a function of said output signal.

4,399,475
TAPE RECORDER

Katsuro Shimomae, Higashikurume, Japan, assignor to Trio Kabushiki Kaisha, Toyko, Japan

Filed Apr. 10, 1981, Ser. No. 252,854
Claims priority, application Japan, Apr. 14, 1980, 55-48989; Apr. 14, 1980, 55-48990; Apr. 14, 1980, 55-48991; Apr. 14, 1980, 55-48992; Nov. 26, 1980, 55-166336
Int. Cl.[3] G11B 5/54
U.S. Cl. 360—96.3 20 Claims



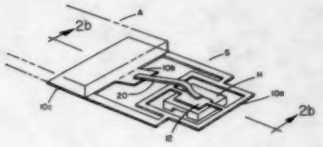
1. In a tape recording/reproducing apparatus having a magnetic head and means for receiving a magnetic tape, a tape drive mechanism comprising:
a rotatable capstan for transporting said tape at a predetermined linear speed;
a drive gear;
means for driving said capstan and said drive gear;
a first rotatable switch gear engageable with said drive gear for switching said tape drive mechanism into a position for at least a first mode of operation;
means for converting rotation of said first switch gear into a displacement of said magnetic head;
means for disengaging said drive gear and said switch gear in said first mode position of operation, said drive gear only being engaged with said first switch gear when the operation is switched to said first mode to shift said magnetic head relative to said tape to a position corresponding to said first mode of operation;
means for retaining said first switch gear in position for said first mode of operation;
a second rotatable switch gear engageable with said drive gear for switching said tape drive mechanism into a position for at least a second mode of operation other than the first mode;
means for converting the rotation of said second switch gear into a displacement of said magnetic head;
means for disengaging said drive gear and said second switch gear in said second mode position of operation, said drive gear only being engaged with said second switch gear when the operation is switched to said second mode to shift said magnetic head relative to said tape to a position corresponding to said second mode of operation; and
means for retaining said second switch gear in position for said second mode of operation.

4,399,476
SUSPENSION ASSEMBLY FOR MAGNETIC HEAD

Francis K. King, San Jose, Calif., assignor to Datapoint Corporation, San Antonio, Tex.

Filed Apr. 13, 1981, Ser. No. 253,577
Int. Cl.[3] G11B 5/48, 21/16, 15/64, 5/60
U.S. Cl. 360—104 9 Claims

1. A suspension assembly for carrying a magnetic recording head in close following relation to the surface of a moving recording media, said suspension assembly comprising:
(a) a rigid suspension arm;
(b) gimbal mounting means attached to said suspension arm for engaging the recording head such that the recording head is permitted resilient transverse, pitch, and roll movements;
(c) a flexible, substantially flat, cantilevered spring tongue attached to and extending from said suspension arm; and
(d) a rigid load arm attached at one end to the free end of said spring tongue, the distal end of said load arm contacting said gimbal mounting means adjacent the recording head;

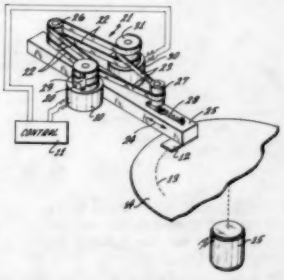


(e) said load arm being configured such that said spring tongue is caused to resiliently deflect by a predetermined amount resulting in a load force being transmitted through said load arm to the recording head, thereby urging the recording head toward the recording media such that the recording head is spaced from the recording media by a predetermined flying height with the magnitude of the load force and, therefore, the predetermined flying height being established by the configuration of said load arm.

4,399,477
SPLIT BAND ACTUATOR

Philip Bryer, 4271 Chaumond Rd., Woodland Hills, Calif. 91364

Filed Dec. 4, 1980, Ser. No. 212,985
Int. Cl.[3] G11B 5/56, 25/04
U.S. Cl. 360—106 14 Claims

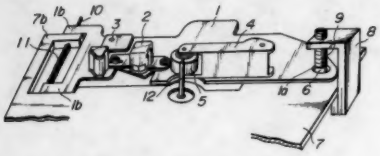


1. An actuator and positioning device of the split-band variety, for positioning an actuator member, there being a stepping motor driving a capstan in steps, the split band being affixed to the capstan, extending therefrom and having two band portions with ends, the improvement comprising:
first and second means on the member around which the two band portions are respectively looped:
a stepping device to which both of the said ends are affixed, the stepping device longitudinally displacing the ends in opposite directions; and
control means for the stepping device, operating the stepping device in steps so that for each position of the member as provided by the step position of said motor, there is at least one additional position of the member not attainable by a change in step position of the said motor.

4,399,478
FIXTURE DEVICE FOR MAGNETIC HEAD

Ryoichi Sawaki, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Sep. 15, 1980, Ser. No. 187,523
Claims priority, application Japan, Sep. 14, 1979, 54/127381[U]
Int. Cl.³ G11B *21/24, 5/54*
U.S. Cl. 360—109 19 Claims

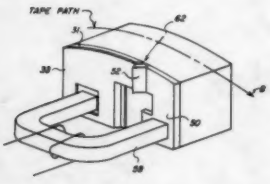


1. A fixture for a magnetic head, comprising a base member, a base plate, a magnetic head on said base plate, a rotating support member for rotatably supporting the base plate on the base member, and a guide pin on the base member for guiding the plate in the rotating direction, said base plate defining a plane, said magnetic head defining a gap transverse to said plane, said base plate being rotatably movable along the plane so that said gap advances and retracts with movement of the plate, said pin guiding the plate along the plane.

4,399,479
THIN FILM MAGNETIC HEAD HAVING GOOD LOW FREQUENCY RESPONSE

Benjamin B. Meckel, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,201
Int. Cl.³ G11B *5/22, 5/16, 5/42*
U.S. Cl. 360—126 3 Claims

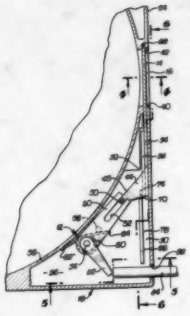


1. A structure useful in a thin film magnetic head having good low frequency response comprising
(a) a non-magnetic support having a generally planar surface,
(b) a first generally planar thin film of magnetic material deposited on a first part of said planar surface and having at least one tapered edge thereof,
(c) a thin film of non-magnetic material deposited on both said tapered edge of said first thin film of magnetic material and over at least part of the planar surface thereof, and
(d) a second generally planar thin film of magnetic material deposited on a second part of the surface of said non-magnetic support and upon said non-magnetic film on said tapered edge of said first thin film of magnetic material,
said thin films of magnetic material constituting the poles of said magnetic head structure and said thin film of non-magnetic material defining a slanted transducer gap between said poles, part of said thin film of non-magnetic material being further deposited on said second part of the planar surface of said non-magnetic support so as to reside beneath said second thin film of magnetic material in proximity of said transducer gap, thereby to lessen the chance of inadvertent magnetic short circuiting of flux across said slanted transducer gap from one head structure pole to the other.

4,399,480
HEAD ACCESS DOOR, OPENING MECHANISM AND METHOD OF SEALING

Roy J. Edwards, San Jose, Calif., assignor to Disctron, Inc., Milpitas, Calif.

Filed Mar. 30, 1981, Ser. No. 248,807
Int. Cl.³ G11B *23/02, 15/32;* G03B *1/04;* G01D *15/24*
U.S. Cl. 360—132 17 Claims

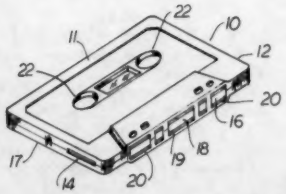


1. A door mechanism for an opening in a wall of a cartridge, said door mechanism closing a door over said opening when said cartridge is not in use and opening said door when said cartridge is in use, comprising:
a substantially flat door slideable linearly along its length along said wall of said cartridge over said opening;
and
a bellcrank rotatable about its axis in either direction and having a first arm coupled to said door, said bellcrank being biased to rotate in one direction so that said first arm forces said door to slide linearly along its length in a first direction to close over said opening when said cartridge is not in use, and having a second arm to which a force is applied when said cartridge is in use to rotate said bellcrank in the opposite direction so that said first arm forces said door to slide linearly along its length in the opposite direction, thereby opening said door.

4,399,481
LOCKOUT DEVICE FOR TAPE CASSETTE

Robert T. Loranger; John P. Loranger, and John R. Peltz, all of Warren, Pa., assignors to Loranger Manufacturing Company, Warren, Pa.

Filed Apr. 13, 1981, Ser. No. 253,701
Int. Cl.³ G11B *15/04, 23/04*
U.S. Cl. 360—132 2 Claims



1. In a tape cassette: a cassette housing formed of a pair of shells with each shell having a pair of spaced opposite sides,

the shells being disposed in operative position adjacent to each other with respective sides thereof in alignment with each other;

and means for interconnecting the shells when the latter are in operative position to form said housing,

a web on and extending along each side of said housing, holding said shells in spaced relation to each other,

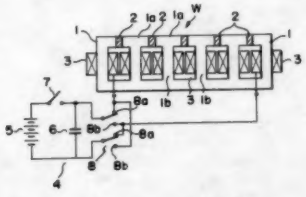
a movable cylindrical captive member disposed in a cassette shell aperture, said aperture having two generally parallel flat side surfaces, said member being adapted to be manipulated by the user to effectively block the access of a record lock-out lever, or allow said lever to penetrate the cassette shell, whereby the user can prevent the accidental erasure or re-recording of the tape when the movable member is in the retracted position, but can deliberately allow re-recording by positioning the movable member to the extended position, and selectively manipulate the captive member to block access of said lock-out lever, said captive member comprising an elongated body having a central axis disposed perpendicular to said spaced shells and a hub on one end of said captive member extending through an opening in one of said spaced shells and means on said captive member to rotate said captive member, a notch formed in said cylindrical member comprising spaced ends of said notch adjacent the flat ends of said captive member, generally perpendicular to the central axis of rotation of said cylindrical body, said flat ends extending from one side of said captive member through the central axis of said captive member and terminating between said central axis and the opposite side of said captive member, said notch having a generally flat bottom disposed in a plane generally parallel to a plane tangent to said cylindrical surface and intersecting the outer cylindrical surface at each side thereof, said notch being adapted to receive said lock-out lever when said captive member is rotated.

4,399,482

MAGNETIC HOLDER

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 7, 1980, Ser. No. 119,564
Claims priority, application Japan, Feb. 8, 1979, 54-14044
Int. Cl.³ H01F 7/04
U.S. Cl. 361—145 **2 Claims**



1. A magnetic holder for releasably retaining a ferromagnetic object, comprising:

a core member composed of a magnetically semi-hard material capable of magnetic retention after magnetization without substantial reduction, said material consisting essentially of a semi-hard spinodal-decomposition type magnetic alloy having a coercive force not greater than 600 oersted;

coil means disposed in inductive relation to said member for the magnetization and demagnetization of said core member;

a source of an essentially unidirectional momentary short-duration electrical pulse connectable to said coil means; and

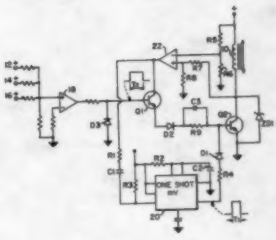
a single multiposition switch between said coil means and said source, said switch having a pair of operative positions and being operable in a first of said positions for passing said essentially unidirectional momentary short-duration electrical pulse from said source through said coil means in a first direction to retentively magnetize said core member and thereby enable it to retain said object for an entire holding duration after disappearance of said pulse, said switch being operable in its second position for passing a subsequent essentially unidirectional momentary short-duration electrical pulse from said source through said coil means in a second direction opposite to the first direction to permanently demagnetize said core member.

4,399,483

SOLENOID CURRENT CONTROL

Brian D. Phelan, New Britain, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed Feb. 8, 1982, Ser. No. 346,489
Int. Cl.³ H01H 47/32
U.S. Cl. 361—154 **11 Claims**



1. A current control for a solenoid actuator, the actuator including a coil and a movable armature associated therewith, said control comprising:

normally non-conductive controllable solid state switch means, said switch means being connected in series with the actuator coil and a current source;

means responsive to the voltage across the actuator coil for generating a control signal;

means responsive to input command signals and to said control signals for generating trigger pulses;

timer means responsive to said trigger pulses for generating switch control pulses of a first polarity and a preselected duration, said switch control pulses being of sufficient magnitude to cause said switch means to change from the non-conductive state to a saturated state, the duration of said switch control pulses being commensurate with the time required for the current through the actuator coil to increase to a level which will generate a sufficiently strong field to impart motion to the actuator armature;

means for applying said switch control pulses to said switch means; and

means for applying control signals of the said first polarity generated by said means responsive to the voltage across the actuator coil to said switch means when an input command signal is present.

4,399,484

INTEGRAL ELECTRIC MODULE AND ASSEMBLY JET COOLING SYSTEM

Arnold H. Mayer, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1981, Ser. No. 242,502
Int. Cl.³ H05K 7/20
U.S. Cl. 361—382 **7 Claims**

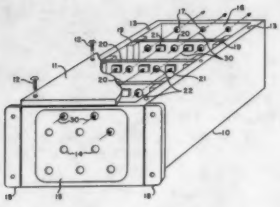
1. An improved electronics cooling system comprising:

a. a housing having an inlet at one end thereof and an outlet

at a second end thereof for passage of fluid coolant therethrough;

b. holding means for maintaining a plurality of printed circuit boards in a spaced and generally parallel array within said housing;

c. a plurality of printed circuit boards within said housing maintained in a spaced and generally parallel array by said holding means, each of said printed circuit boards having heat generating electronic components mounted thereon



and including means defining passageways therethrough configured for passage of said fluid coolant by the formation of fluid jet streams, said passageways positioned to provide direct impingement of said streams onto each component mounted on the next successive board in said array for providing localized and highly efficient cooling to said components; and

d. means for providing flow of fluid coolant through said housing.

4,399,485

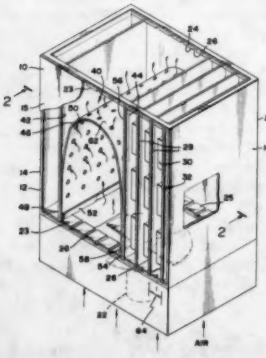
AIR BAFFLE ASSEMBLY FOR ELECTRONIC CIRCUIT MOUNTING FRAME

Kurt O. Wright, Sun Valley; Timothy L. Brehm, Irvine; Duaine E. Berger, Los Angeles, and Paul S. Matsuoka, Culver City, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 133,277, Mar. 24, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,480

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—383 **9 Claims**



1. An assembly comprising:

an electronic mounting frame adapted to receive and maintain in parallel spaced relationship a maximum number of electronic elements;

at least one and less than the maximum number of electronic elements, each occupying an amount of space; and

a baffle assembly that is adaptable for insertion into the electronic mounting frame in place of a selectable given number of electronic elements, the baffle assembly being inserted into the electronic mounting frame in place of a selected given number of electronic elements and having a web member including at least one bend having an angle which may be varied to permit the web member to extend or retract as necessary to extend across a space that is occupiable by the selectable given number of electronic elements, the web member extending across a space within the electronic mounting frame that is occupiable by the selected given number of electronic elements, the web member having a plurality of apertures therethrough with a ratio of total aperture area to total web member surface area being approximately equal to a ratio of space occupied by one of the electronic elements to total space available for the one electronic element within the frame, the plurality of apertures presenting an impedance to a flow of cooling air through the electronic mounting frame which approximates an impedance which would be presented by the selected given number of electronic elements if said given number of electronic elements were inserted into the electronic mounting frame in the space occupied by the baffle assembly.

4,399,486

TRANSISTOR CONTROL UNIT FOR A SERVO MOTOR

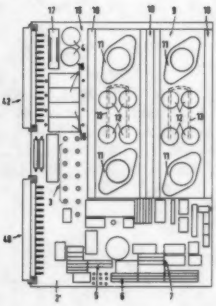
Johann Petsch, Poing, Fed. Rep. of Germany, assignor to A.S.R. Servotron AG, Geneva, Switzerland

Filed May 5, 1981, Ser. No. 260,759

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031287

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **9 Claims**



1. A transistor control unit for a servo motor, which comprises: an electronic control part which in turn comprises components arranged on one face of a printed circuit element, these components including a number of driver transistors for an end state, integrated circuits, and a plurality of resistances, with a printed circuit on the rear face of the element; and a power part, which is spatially separated from the control part and comprises a number power transistors which are mounted on a cooling body together with associated power diodes, the cooling body, the transistors and the associated diodes being arranged on the same printed circuit element and being disposed on the same side thereof as the components of the control part and to the side of the control part; the current flow connections leading from the power part to the control part being printed current flow guide paths disposed on the rear face of the printed card; a number of resistances, the value of each of which is similar or identical, of the control part being arranged as resistance arrays in flat, rectangular housings, which are disposed, on the printed circuit element, with their main surfaces extending vertically, pluralities of rectangular housings being juxtasposed to one another with their main surfaces in mutual abutment so as to form at least blocks of

resistance arrays, each block comprising at least two said housings.

4,399,487

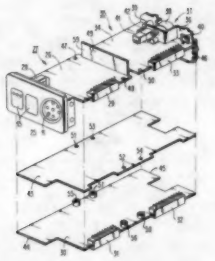
INSULATED PLUG-IN MODULE

Leopold Neumann, Lexington, Mass., assignor to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 186,534, Sep. 12, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,684

Int. Cl.³ H05K 7/06

U.S. Cl. 361—391 7 Claims



1. A cabinet having

(1) wall means defining a plurality of recesses designed for sliding insulated plug-in modules therein; and

(2) a plurality of insulated plug-in modules, each of said plug-in modules being inserted into one of said recesses, respectively, and comprising in combination:

(a) a case of an insulating material;

(b) a front wall carrying front connection means, said front connection means being determined for receiving input signals which are specific to a certain application;

(c) a back wall carrying rear coupling means;

(d) a first and second plurality of structural elements and components for power and signal transmission and for signal processing, said first and second plurality of elements and components being connected to form respective first and second internal electrical circuits, whereby said first circuits are specific to said application, and whereby said second circuits are identical for various applications and identical for said plurality of plug-in modules;

(e) a first printed circuit board connected between said front wall and said back wall, said board supporting said first plurality of structural elements and said first plurality of components forming said first circuits which are specific to said application;

(f) a second printed circuit board mounted on said back wall and arranged parallel to said first printed board, said second board supporting said second plurality of structural elements and said second plurality of components forming said second circuits which are identical for various applications, said second board being inserted along with said first board and said back wall in said case such that said front wall forms the front wall of said case, said case and said front wall thereby forming the housing of said plug-in module.

4,399,488

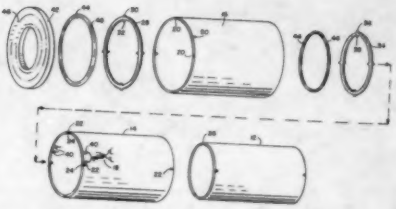
RIGHT CIRCULAR SUBSTRATE PACKAGING

Victor W. Ruwe; James A. Kerr, both of Huntsville, Ala., and Rene F. Sandeau, Jr., Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1981, Ser. No. 289,606

Int. Cl.³ H05K 1/14

U.S. Cl. 361—412 5 Claims



1. A cylindrical electronic packaging arrangement comprising a plurality of elongated cylinders of different diameters and having electronic components mounted on surfaces thereof with output leads from the surfaces located at the ends of the cylinders, insulating spacer means between the cylinders and being keyed to the cylinders to space the cylinders relative to each other, an end cap over the end of the cylinders at each end and having connector pins connected through connector means to innerconnect the output leads with the connector pins in the end cap to connect the electronic components out through said end cap, and said end cap being sealed relative to said cylinders.

4,399,489

HIGH TEMPERATURE ELECTROLYTIC CAPACITOR

Sidney D. Ross, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 25, 1982, Ser. No. 361,994

Int. Cl.³ H01G 9/00

U.S. Cl. 361—433 4 Claims

1. An electrolytic capacitor having a wound capacitor section having an etched aluminum foil anode bearing a dielectric oxide barrier layer, an aluminum foil cathode, spacer material interleaved between said anode and said cathode and contiguously wound therewith, and an electrolyte in contact therewith, said electrolyte comprising N-methylpyrrolidinone and up to 5 wt% ethylene glycol as solvent and a solute mixture of diisopropylammonium pentaborate and dimethylammonium or diisopropylammonium boro-di-catecholate, said electrolyte affording capacitor operation at 130° to 150° C.

4,399,490

OPAQUE REFLECTOR FOR MULTILAMP PHOTOFLASH ARRAY

David R. Broadt, Lewisburg, Pa., assignor to GTE Products Corporation, Stamford, Conn.

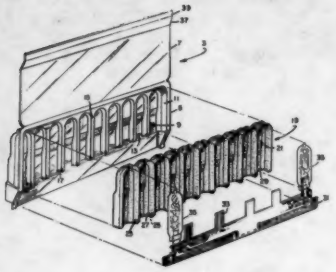
Filed Feb. 27, 1981, Ser. No. 238,867

Int. Cl.³ G03B 15/02

U.S. Cl. 362—11 3 Claims

1. A photoflash array having a housing member containing a reflector unit which includes at least one cavity formed to receive a flashlamp and characterized by the improvement wherein said cavity includes a pair of spaced sidewalls with a reflective material on said pair of spaced sidewalls substantially normal to the opening thereof and on the surface thereof im-

mediately adjacent said flashlamp and is formed from a relatively opaque pigmented plastic resin material selected from



the group consisting of carbon black and titanium dioxide whereby back radiation of light energy is inhibited.

4,399,491

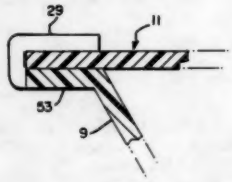
FOLDED EDGE SEAL FOR FLASHLAMP ARRAY

Carl F. Kackenmeister, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 238,866, Feb. 27, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 401,451

Int. Cl.³ B29C *27/08*; G03B *15/02*

U.S. Cl. 362—11 **9 Claims**



1. In a multilamp photoflash unit having a plastic housing member with a foldable light transmittable front portion and multiple cavity back portion formed for enclosure of flashlamps therein, a plastic housing member sealing process comprising the steps of:

folding one of said front and back portions of said plastic housing member with respect to the other to form an envelope for enclosing a plurality of flashlamps;

wrapping a portion of said one of said folded front and back portions about the edge of the other one thereof and aligning said portions to provide more than two layers of plastic housing member;

positioning said multiple layers of wrapped plastic housing member portions intermediate an energizing source; and

activating said energy source to seal at least one of said wrapped plastic layers to another and provide a plastic housing enclosure and container for a multiplicity of flashlamps.

4,399,492

INCANDESCENT AND FLUORESCENT CAPLIGHT DEVICE

Henry R. Kolesar, Mundelein, Ill., assignor to Ocenco Incorporated, Northbrook, Ill.

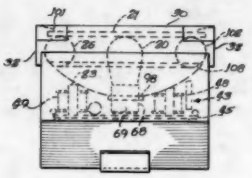
Filed Dec. 8, 1980, Ser. No. 214,132

Int. Cl.³ F21L *15/14*

U.S. Cl. 362—106 **14 Claims**

1. A lighting device for attachment to a protective cap, said lighting device comprising a housing means configured and sized to be worn on and attached to the cap, and incandescent bulb in said housing means for generating light for illumination forwardly of the cap,

a fluorescent bulb in said housing means for generating light for illuminating peripherally and forwardly of the cap, a reflector fixedly mounted in said housing means for directing light from either said incandescent or said fluorescent bulb,



means mounting said incandescent bulb at a fixed location in said housing means and a fixed location with respect to said reflector and said fluorescent bulb,

means mounting said fluorescent bulb at a fixed location in said housing means and at a fixed location with respect to said reflector and said incandescent bulb, and

electrical means for selectively energizing each of said incandescent bulb and said fluorescent bulb depending upon the light desired by the wearer.

4,399,493

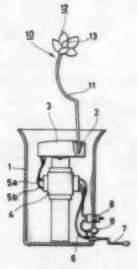
ILLUMINATED ARTIFICIAL FLOWER ORNAMENT

Yoshihiko Kurita, and Naotaka Uchida, both of Tokyo, Japan, assignors to Nihon Dennetsu Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 336,613

Int. Cl.³ F21P *1/02*

U.S. Cl. 362—122 **8 Claims**



1. An illuminated artificial flower ornament comprising:

a support stand positioned in a flower pot-like vessel, the support stand being provided with a number of holes,

electrode means disposed in each of said holes and electrically connected to an electrical power source, and

an artificial flower having a peduncle part in a top end portion thereof, the peduncle part having lighting means electrically connected to said electrode means through a core member in said peduncle part,

said artificial flower being releasably fitted in any one of said holes,

said core member comprising a linear conductor, an insulator covering said linear conductor and a ribbon-like conductor helically wound around insulator in a coaxial arrangement,

said electrode means having a contact point for electrically connecting said ribbon-like conductor and another

contact point for electrically connecting said linear conductor,

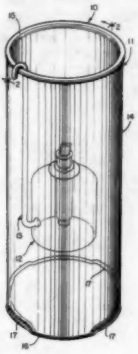
said contact point being spaced from said another contact point along the longitudinal direction of said core member.

4,399,494

DECORATIVE LAMP

David R. Perkins, Manchester, Mass., assignor to Glass Dimensions, Inc., Magnolia, Mass.

Filed Mar. 17, 1981, Ser. No. 244,662
Int. Cl.³ F21L *19/00*
U.S. Cl. 362—163 **5 Claims**



1. A chimney lamp comprising

A. tubular chimney means made of transparent glass or plastic, said chimney means having an upper edge defining an open upper end and a lower end for resting on a surface;

B. illuminator support means for supporting a wick and a fuel supply for the wick, said support means also being made of transparent glass or plastic; and

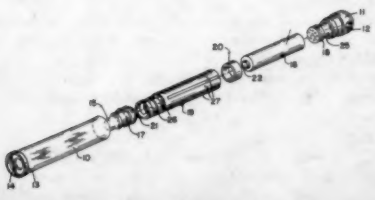
C. elongated transparent glass or plastic hanger means, said hanger means having one end connected to the support means and its other end formed as a hook for removably engaging over said upper edge of the chimney means so as to suspend the support means at a central location in the chimney means appreciably below the upper end thereof for permitting the supporting means and the wick and fuel supply supported thereby to be lifted out of the chimney means by way of the hanger means.

4,399,495

FLASHLIGHT

Norbert Leopoldi, Chicago, and William P. Heinrich, McHenry, both of Ill., assignors to Cloverline, Inc., Chicago, Ill.

Filed Jun. 4, 1982, Ser. No. 384,794
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—189 **5 Claims**



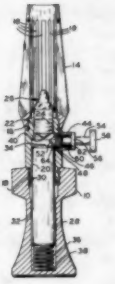
1. A flashlight including a battery, a bulb and an outer shell, said outer shell comprising a container for the battery and bulb, said battery being uninsulated with the metal can exposed throughout a major portion of its length, a generally cylindrical metal clip in the container surrounding the battery and having a plurality of spaced fingers extending lengthwise of the battery at spaced intervals around the battery, said container being flexible and made from a non-conducting plastic material, said container being compressible laterally to engage said metal clip and press one or more of said fingers into contact with said battery can to complete an energizing circuit to said bulb, a rear end cap or plug closing the rear end of the container, and a dielectric ring surrounding said battery which insulates a negative pole of the battery from said cylindrical metal clip, said battery supported at one end in said dielectric insulating ring and at its opposite end in said rear end cap, or plug.

4,399,496

BATTERY POWERED LAMP DEVICE

Eli Lengacher, Rte. 3, Box 559, Grabill, Ind. 46741

Filed Jan. 22, 1982, Ser. No. 341,591
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—203 **13 Claims**



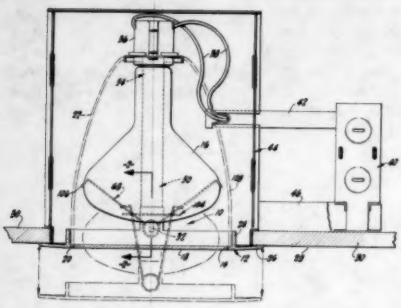
1. A battery powered lamp device comprising an upright base of metal, a bulb and switch-retaining member of metal and an upright chimney, said member having lower and upper ends and being mounted on the upper end of said base, said chimney being mounted on the upper end of said member, a bulb having a base provided with an electrical contact, said base having an upright elongated battery receiving cavity closed at its bottom and open at its top, said member having an upright bore in registry with said cavity, said bulb being mounted within said bore to extend thereabove into the lower portion of said chimney, the base of said bulb being fitted into the upper portion of said bore for positioning said contact centrally of said bore, a compression contact spring within said cavity in electrical contact with the bottom thereof, a battery within said cavity extending into said bore and at one end engaging said spring and further being operatively engageable at the other end with said bulb contact, electrical switch means on said member for controlling the application of energizing voltage of said battery to said bulb, said spring being helical and urging said battery upwardly to engage said other battery end with said bulb contact, said electrical switch means including a manually operable switch element operatively threaded to said member for movement transversely to the longitudinal dimension of said cavity and bore, said switch element having a cam portion on one end operatively engageable with an upper edge portion of said battery whereby rotation of said element in one direction forces said battery downwardly thereby to disengage said battery from said bulb contact and in the other direction permits said battery to move upwardly under the force of said spring to engage said bulb contact.

4,399,497

RETAINER FOR A LAMP

James B. Druffel, Oakland, Calif., assignor to Prescolite, San Leandro, Calif.

Filed Dec. 16, 1980, Ser. No. 217,136
Int. Cl.³ B60Q *3/04*
U.S. Cl. 362—362 **9 Claims**



1. A retainer for supporting a lamp socket to a housing comprising:

a. a base having an opening intended for passage of light from the lamp;

b. a bracket having a proximal portion including means intended for holding the lamp socket, and a distal portion;

c. means for fastening said base to said distal portion of said bracket;

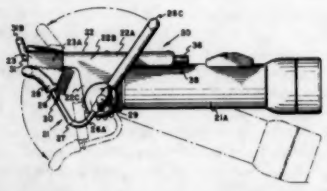
d. means for supporting said base and fastened bracket to the housing including a pair of appendages; means for attaching said pair of appendages to said base and fastened bracket; means for resiliently forcing said, appendages away from each other; and means for supporting said pair of appendages to the housing.

4,399,498

CLAMPING LIGHT CONSTRUCTION AND CLAMPING MEANS THEREFOR

Joseph G. Bacevius, 780 Bridgeport Ave., Shelton, Conn. 06484

Division of Ser. No. 107,373, Dec. 26, 1979, Pat. No. 4,376,965. This application Mar. 2, 1982, Ser. No. 354,029
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 **12 Claims**



1. A clamp construction comprising:

a clamp housing having an end portion defining a fixed clamp jaw,

a movable jaw member pivotally connected to said clamp housing,

said movable jaw member having one end portion defining a movable clamp jaw, and the other end portion a handle, whereby said one end portion defining said movable clamp jaw is disposed to one side of said fixed jaw to compliment said fixed jaw, and said handle being extended to the other side of said fixed jaw,

and means on said first mentioned fixed clamp jaw forming a finger grip means disposed opposite to said handle to facilitate the operation of said clamp construction,

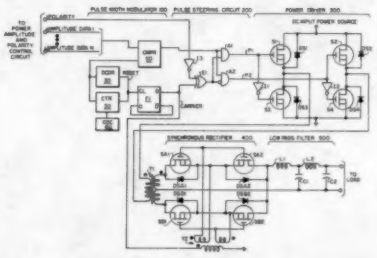
and spring means interposed between said clamping jaws for normally biasing said jaws toward an inoperative closed position and said jaws being readily actuated to open position with one hand by effecting relative rotation of said handle toward said finger grip means.

4,399,499

BI-LATERAL FOUR QUADRANT POWER CONVERTER

James S. Butcher, Glendale Heights; Andrew Chan, Bensenville, and Paul U. Lind, Lombard, all of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 18, 1981, Ser. No. 332,285
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—17 **13 Claims**



1. A power converter for use in a power supply system including a variable electrical load and a power control circuit operated to provide positive and negative polarity signals and a plurality of power amplitude data signals, said power converter comprising:

pulse width modulation means connected to said power control circuit, operated in response to said power amplitude data signals to periodically provide a pulse width modulated signal having a pulse width proportional to the amplitude defined by said power amplitude data signals;

voltage control means connected to said pulse width modulation means, operated in response to said pulse width modulated signal and said positive polarity signal to provide a positive output voltage signal, and further operated in response to said pulse width modulated signal and said negative polarity signal to provide a negative output voltage signal; and

filter means connected to said voltage control means, operated to provide an averaged positive output voltage of a magnitude proportional to the average pulse width of said positive output voltage signal and further operated to provide an averaged negative output voltage of a magnitude proportional to the average pulse width of said negative voltage signal;

said load operated in response to a load voltage less than said averaged positive output voltage to sink current from said voltage control means;

said voltage control means operated in response to a load voltage greater than said averaged positive output voltage to sink current from said load;

said load further operated in response to a load voltage less than said averaged negative output voltage to sink current from said voltage control means; and

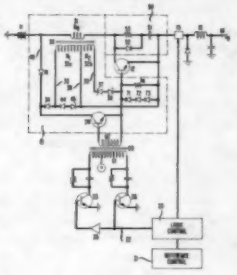
said voltage control means further operated in response to a load voltage greater than said averaged negative output voltage to sink current from said load.

4,399,500

MULTIMODE BASE DRIVE CIRCUIT FOR POWER SWITCHING TRANSISTOR

Patrick W. Clarke, Murray Hill, and Robert E. Schroeder, Flanders, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 29, 1981, Ser. No. 278,349
Int. Cl.³ H02P 13/20
U.S. Cl. 363—97 10 Claims



1. A multimode base drive circuit for a power switching transistor comprising;

a regenerative feedback circuit coupling a main conduction path electrode of the power switching transistor to its drive electrode and including a control transistor to complete a circuit path in the feedback circuit and enable regeneration, and

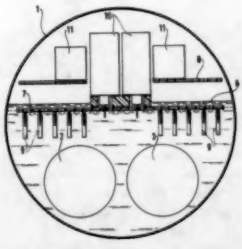
a supplemental drive path including a unidirectional conducting device and coupling a power source in series with the main conduction path electrode of the power transistor to the control transistor whereby drive signals supplied by the regenerative feedback path at a switching transition of the power switching transistor from nonconduction to conduction are supplemented by adding a drive current signal through the supplemental drive path in response to a collector-emitter voltage of the power switching transistor when in a conduction state.

4,399,501

SET OF POWER SEMICONDUCTORS EQUIPPED WITH FIRING TRANSFORMERS AND WITH PROTECTION CIRCUITS

Michel Masselin, Velizy-Villacoublay, France, assignor to Alsthom-Atlantique, Paris, France

Filed Apr. 17, 1981, Ser. No. 255,079
Claims priority, application France, Apr. 21, 1980, 80 08865
Int. Cl.³ H05K 7/20
U.S. Cl. 363—141 1 Claim



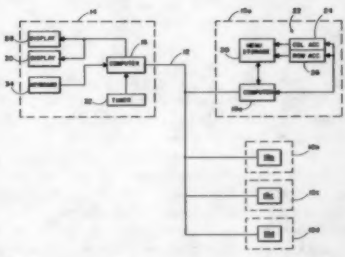
1. In a sealed chamber, means mounting a set of power semiconductors equipped with firing transformers and resistors and capacitors forming protection circuits within said chamber, said mounting means comprising: end plates with said semiconductors being disposed in columns immersed in a cooling fluid and being installed between said end plates, supports, said transformers and said resistors and capacitors being disposed on said supports, printed circuits on said supports connecting the firing transformers, the resistors and capacitors, said printed circuits on said supports being disposed in at least one plane parallel to axes of said columns, the level of the cooling fluid being such that the transformers and capacitors are above the cooling fluid in the liquid state, and wherein said supports are made integral with said end plates by means of tie rods which pass through said supports, each of said tie rods being fitted into the end surface of one of said plates.

4,399,502

INSTRUMENT CONTROL SYSTEM

Scott N. MacDonald, Pleasant Hill, and Haakon T. Magnussen, Jr., Pinole, both of Calif., assignors to Altex Scientific Inc., Berkeley, Calif.

Filed Feb. 19, 1981, Ser. No. 235,805
Int. Cl.³ G06F 15/46
U.S. Cl. 364—189 8 Claims



1. Apparatus for controlling an instrument to perform one or more predetermined operations, comprising:

an instrument having means for receiving an "increment" signal and an "execute" signal; means for accumulating the number of "increment" signals that are received by the instrument and storing an index number representing the result of the accumulation; memory means for storing data for the one or more predetermined operations, the data for each such operation including an identifier representing the descriptive name of the respective operation; means for selecting, from the stored data, selected data relating to a specified one of the one or more predetermined operations as a function of the current value of the index number; means for transmitting an identification signal encoded to represent alphanumeric characters determined by the identifier included in the currently selected data; and means for performing the operation related to the selected data each time the instrument receives the "execute" signal; and

a control terminal having transmitting means for selectably producing and transmitting the "increment" signal and the "execute" signal, means for receiving the identification signal, and means for displaying the encoded alphanumeric characters.

4,399,503

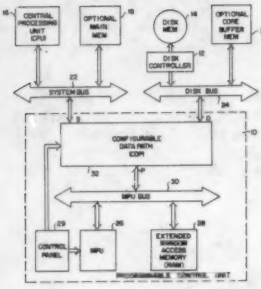
DYNAMIC DISK BUFFER CONTROL UNIT

Kenneth R. Hawley, Ventura, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 30, 1978, Ser. No. 920,831
Int. Cl.³ G06F 13/04
U.S. Cl. 364—200 10 Claims

1. A system for coupling a data processing system to a data

storage subsytem comprising a random access memory and data transfer control means responsive to commands from said data processing system for preaccessing and transferring to said random access memory a predetermined amount of data resident in said data storage subsystem, and a configurable data path means connected to intercept said commands and adapted to respond to said commands for providing a data path between said data processing system and said data storage subsystem, between said data processing system and said random access memory, and between said random access memory and



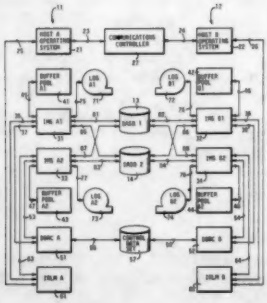
said data storage subsystem, as required by commands from said data processing system to said data storage subsystem intercepted by said configurable data path means, where said data transfer control means responds to intercepted commands for each requested access to said data storage subsystem for a block of data and controls accessing said random access memory for said block of data if previously transferred and still retained in said random access memory, and if not, controls accessing said data storage subsystem for transfer of said block of data both to said data processing system and to said random access memory simultaneously.

4,399,504

METHOD AND MEANS FOR THE SHARING OF DATA RESOURCES IN A MULTIPROCESSING, MULTIPROGRAMMING ENVIRONMENT

Ronald L. Obermarck, Los Altos; Jimmy P. Strickland, Saratoga, and Vern L. Watts, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,483
Int. Cl.³ G06F 9/46
U.S. Cl. 364—200 **8 Claims**



1. A machine-implementable method for operating a computing system, including plural central electronic complexes processing work units of one or more programs concurrently to control access to data resources shared by at least two central electronic complexes with minimum communication of sharing control parameters, comprising the steps of:

maintaining within each complex the interest state of each complex in each of a plurality of resource congruence classes, with a complex having an interest in a congruence class if it has previously granted or waited access to a data resource which is a member of the congruence class;

generating within a first complex a first request for access to a resource having a resource key and a resource congruence class;

determining the interest state of said first complex and of a second complex in the resource congruence class of the first access request;

responsive to the determination that the first complex has an interest and the second complex does not have an interest in the resource congruence class of the first access request, processing the first access request within the first complex;

responsive to the second complex having an interest in the resource congruence class of the first access request, communicating the first access request to the second complex for additional processing;

responsive to neither complex having an interest in the resource congruence class of the first access request, communicating the new interest state of the first complex in the resource congruence class of the first access request to the second complex, and processing the first access request within the first complex; and

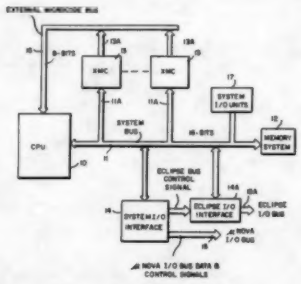
the processing of the first access request selectively granting, denying, or waiting access to the resource.

4,399,505

EXTERNAL MICROCODE OPERATION IN A MULTI-LEVEL MICROPROCESSOR

Michael B. Druke, Chelmsford, Mass.; Richard L. Feaver, Sunnyvale, Calif., and Stefan Kosior, Chepachet, R.I., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 6, 1981, Ser. No. 232,238
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **11 Claims**



1. A data processing system comprising

a central processor unit including

means responsive to a macroinstruction for decoding said macroinstruction to produce a sequence of one or more microinstructions; and

processing logic means responsive to said microinstructions for executing said microinstructions to provide one or more data processing operations;

said system further comprising

one or more external microcode control units, each including

means responsive to a macroinstruction received from said central processor unit for decoding said macroinstruction to produce a sequence of one or more microinstructions;

means responsive to said decoding means for transmitting said one or more microinstructions to said central processor unit for execution thereby;

and said decoding means further including means responsive to a macroinstruction received from said central processor unit for determining whether said macroinstruction is one which is to be decoded by a selected one of said external microcode control units or one which is to be decoded by said central processor unit.

4,399,506

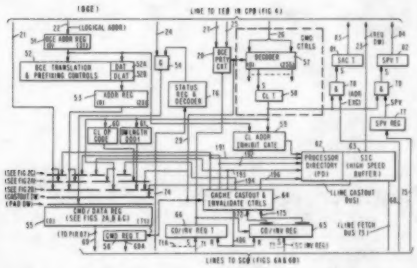
STORE-IN-CACHE PROCESSOR MEANS FOR CLEARING MAIN STORAGE

Charles W. Evans, Austin, Tex.; Frederick O. Flusche, Hyde Park, N.Y.; Benedicto U. Messina; Ethel L. Richardson, both of Poughkeepsie, N.Y.; James R. Robinson, Clinton Corners, N.Y., and Joseph A. Wetzel, New Paltz, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,639

Int. Cl.³ G06F *13/00, 9/06*

U.S. Cl. 364—200 **19 Claims**



13. Means for clearing a line at a time in main storage (MS) in a data processing system having a central processor (CPU) with a store-in-cache (SIC) having a processor cache directory and cache control means, comprising:

cache control means for connecting the processor cache directory and SIC to the processor and MS,

command means for providing processor storage requests and a special clear line (CL) command to the cache control means, the CL command containing a MS line address to be cleared,

inhibit means associated with the cache control means to inhibit the processor cache directory from having any fetch from MS when the command means issues the CL command,

invalidating means in the cache control means operating to invalidate any line in the SIC having the MS line address without any castout of the line content,

whereby the CL command is sent to MS to overwrite the line in MS with pad data regardless of whether the line exists in the associated SIC.

4,399,507

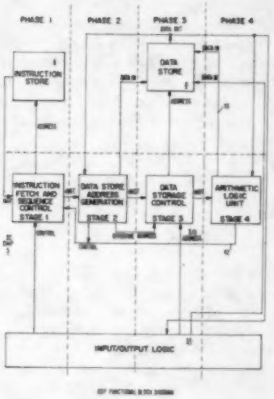
INSTRUCTION ADDRESS STACK IN THE DATA MEMORY OF AN INSTRUCTION-PIPELINED PROCESSOR

Michael R. Cosgrove, deceased, late of Haymarket, Va. (by Dorothy M. Cosgrove, administratrix); Alexander H. Frey, Jr., Cabin John, Md.; Kenneth A. Moore, Manassas, Va.; Abraham Peled, San Jose, Calif.; Frederic N. Ris, Mohegan Lake, N.Y., and William W. Sproul, III, Reston, Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,417

Int. Cl.³ G06F *9/28*

U.S. Cl. 364—200 **26 Claims**



1. In a stored program data processor formed on an integrated circuit chip, having a pipelined instruction mechanism including four time-sequential stages with a first stage for instruction sequencing and fetch, a second stage for data store address generation, a third stage for data store access, and a fourth stage for arithmetic execution, said stages operating in an overlapped mode on successive instructions each including an op code and an operand, which are accessed from an instruction store external to said chip, to carry our arithmetic operations on data accessed from a data store external to said chip, an improved instruction branching mechanism, comprising:

a last-in-first-out instruction address stack in a partitioned area of said data store, for storing addresses for said instruction store;

an instruction address multiplexer in said first stage having an output connected to an address input of said instruction store and having a plurality of inputs, for inputting instruction addresses to said instruction store;

an instruction address incrementer in said first stage having an input connected to said output of said multiplexer and an output connected through a sequential address register to one of said inputs of said multiplexer, for sequentially incrementing said instruction store addresses by unity;

a stack register in said first stage having an input selectively connected to either an output of said sequential address register or to an output from said instruction address stack in said data store, for storing the last instruction store address outputted from said incrementer or storing the last instruction store address outputted from said instruction address stack in said data store and having an output selectively connected to either an input to said multiplexer or to an input to said instruction address stack in said data store;

an instruction sequencing decoder in said first stage having an input connected to an output of said instruction store and an output connected to said multiplexer, for selec-

tively controlling the connection of said instruction store address input, through said multiplexer, to either said sequential address register output or to said stack register output in response to the op code of the last instruction word accessed from said instruction store;

said multiplexer having one of its said plurality of inputs connected to said output of said instruction store for selectively transferring the operand of the last instruction accessed therefrom as a branch address input to said instruction store in response to the decoding of the associated op code in said instruction sequencing decoder;

a data store accessing decoder in said second stage having an input connected to said instruction store output, for decoding the op code from the last instruction accessed from said instruction store;

a data store address generator in said second stage having an input connected to said instruction store output, a control input connected to said data store accessing decoder, and an output, for selectively generating a data store address from the operand of said last accessed instruction word in response to the decoding of the associated op code in said data store accessing decoder;

a stack pointer in said second stage having a control input connected to said data store accessing decoder and an output, for selectively incrementing or decrementing a data store address value for accessing the last instruction address stored in said instruction address stack in said data store;

a data store address register in said third stage, having an input connected to said data store address generator output and to said stack pointer output, and an output connected to the address input of said data store, for accessing a location in said data store;

said instruction sequencing decoder selectively controlling the transfer of the operand of a branch instruction through said multiplexer to said address input of said instruction store in response to the associated branch op code and selectively controlling the loading of the next sequential address in said sequential address register into said stack register in response to said associated branch op code;

an op code decoder in said third stage having an input connected to said instruction store output and a control output connected to said data store, for selectively controlling the nondestructive inputting of the contents of said stack register to the data input of said data store in response to said associated branch op code;

said data store accessing decoder, in response to said branch op code, selectively controlling the incrementing of said stack pointer by unity and the outputting of its contents to said data store address register as the address of the location in said instruction address stack for storing said contents of said stack register as the return address from the branch specified in said branch op code;

whereby said otherwise unused second and third stages are employed during a branching operation to access said instruction stack which is not located on said integrated circuit chip.

4,399,508

CASH CHECKING READ OPERATION IN AN ELECTRONIC CASH REGISTER

Hiroshi Nakatani, Yamatokoriyama, and Hachizou Yamamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1981, Ser. No. 301,961

Claims priority, application Japan, Sep. 19, 1980, 55-131340

Int. Cl.[3] G07G 5/00; G06C 29/00; G06F 3/12

U.S. Cl. 364—405 **7 Claims**

1. An electronic cash register comprising:

a main housing for said electronic cash register;

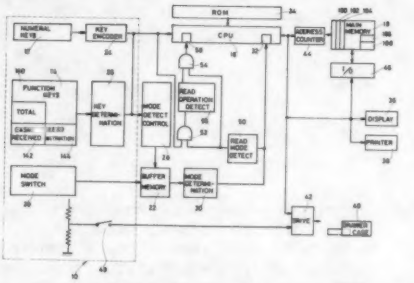
a drawer case secured to said main housing for containing cash received from customers;

a keyboard panel for introducing transaction data into said electronic cash register; and

a read operation control system for controlling a read operation conducted by said electronic cash register, said read operation control system comprising:

a read mode switch for placing said electronic cash register in a read mode;

read operation detection means for developing a read operation detection output when numeral data indicating the cash amount contained in said drawer case is introduced from said keyboard panel when said register is in said read mode;



read instruction switch means disposed on said keyboard panel for instructing the reading operation of the transaction data stored in a memory of said electronic cash register;

printer means for printing out the transaction data stored in said memory and read out from said memory in response to an actuation of said read instruction switch means; and means for prohibiting said reading operation instructed by said read instruction switch means when said read operation detection output is not developed from said read operation detection means.

4,399,509

APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 858,612, Dec. 8, 1977, Pat. No. 4,188,541, which is a division of Ser. No. 780,971, Mar. 24, 1977, abandoned, which is a continuation of Ser. No. 657,543, Feb. 12, 1976, Pat. No. 4,052,618, which is a division of Ser. No. 468,005, May 7, 1974, Pat. No. 3,944,833, which is a division of Ser. No. 349,198, Apr. 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,358, Aug. 21, 1969, abandoned. This application Nov. 13, 1979, Ser. No. 93,123

Claims priority, application United Kingdom, Aug. 23, 1968, 40317

The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

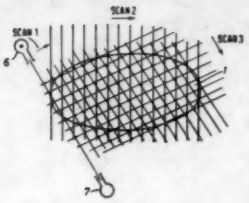
Int. Cl.[3] G06F 15/42

U.S. Cl. 364—414 **68 Claims**

63. A method comprising the steps of:

irradiating a transverse section of a body with penetrating radiation from many different directions, detecting body-attenuated radiation to produce signals related thereto for many respective directions, correcting the signals on the basis of contributions from others of said signals to enhance their usefulness for building an accurate picture of

said section, and building up a picture of said transverse section by cumulatively allocating the corrected signals to



picture strips which are along the respective directions corresponding to the respective corrected signals.

4,399,510

SYSTEM FOR MONITORING UTILITY USAGE

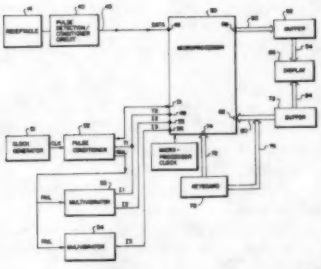
John R. Hicks, Irving, Tex., assignor to Nuclear Systems, Inc., Baton Rouge, La.

Continuation-in-part of Ser. No. 26,804, Apr. 3, 1979, Pat. No. 4,261,037. This application Apr. 6, 1981, Ser. No. 251,048

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.[3] **G06F** *15/20;* **G01R** *19/04*

U.S. Cl. 364—464 **21 Claims**



1. Electrical circuitry for monitoring the amount of usage of electrical energy comprising:

pulse means for optically sensing each revolution of a rotating disk within an electric meter and for generating a data digital pulse signal at a frequency representative of the rate of usage of electrical energy;

clock means for generating a clock digital pulse signal representative of real time;

storage means for storing a first signal representative of a predetermined time period and a second signal representative of a predetermined amount of accumulated usage of electrical energy for said time period;

first counting means responsive to said data digital pulse signal for generating an accumulated signal representative of the current amount of accumulated electrical energy usage;

second counting means responsive to said clock digital pulse signal for generating a time signal representative of the current expired time;

calculator means responsive to said first signal, said time signal and said accumulated signal for generating a projected signal representative of the projected amount of accumulated electrical energy usage of said system for said predetermined time period; and

comparator means responsive to said projected signal and said second signal for generating a control signal in response to said projected signal being greater than said second signal.

4,399,511

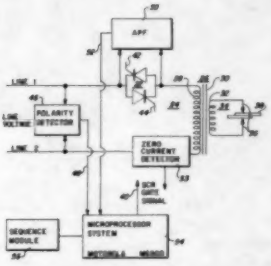
POWER FACTOR MONITORING AND CONTROL SYSTEM FOR RESISTANCE WELDING

Dennis J. Jurek, Grafton, Wis., assignor to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 6,990, Jan. 29, 1979, Pat. No. 4,254,466. This application Jan. 8, 1981, Ser. No. 223,520

Int. Cl.[3] **G06F** *15/46;* **B23K** *9/10*

U.S. Cl. 364—477 **7 Claims**



1. A control system for controlling the quality of a weld in a resistance welding apparatus with the apparatus including a pair of welding electrodes and a welding transformer having a secondary winding connected to the electrodes and a primary winding connectible to an AC source for energizing the primary winding and the secondary winding with alternating polarity half cycles of welding current comprising:

means for measuring a change in an interval between the instant when current is initiated and extinguished during a preprogrammed half cycle and at least one subsequent half cycle; and,

means for terminating the weld current when the measured change is at least equal to a programmed threshold value indicative of a quality weld.

4,399,512

WAVEFORM SEARCHING SYSTEM

Masafumi Soma, Fussa, and Yoshihiko Kohno, Kokubunji, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,462

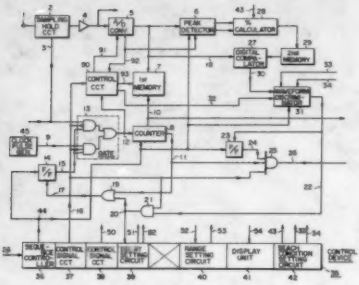
Claims priority, application Japan, Dec. 27, 1979, 54-169455

Int. Cl.[3] **H01J** *29/70*

U.S. Cl. 364—487 **2 Claims**

1. In a waveform searching system for a sampling oscilloscope, in which the instantaneous level of a high-speed sawtooth signal generated by a trigger signal synchronized with an input analog signal and the instantaneous level of a properly attenuated or amplified X-axis sweep wave are compared with each other to generate a pulse in a case of coincidence therebetween, thereby to generate sampling pulses sequentially delayed after the trigger signal by a constant time; the input analog signal is sampled by the sampling pulses to produce sampled pulses; and the sampled pulses are displayed by the X-axis sweep signal on a CRT, the improvement comprising detecting means for producing a coincidence signal if a predetermined condition is detected where a waveform formed by respective peak values of the sampled pulses crosses in a predetermined direction at a predetermined search level by a predetermined number; and control means operatively connected to the detection means for sequentially changing a time base

range of the CRT until said detecting means produces the coincidence signal, whereby the sampled pulses having the



predetermined condition are automatically displayed on the CRT.

4,399,513

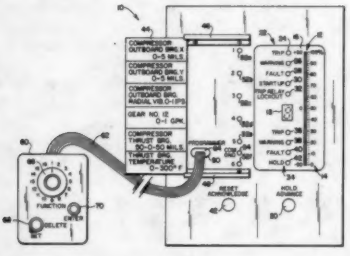
MACHINE MONITORING SYSTEM AND APPARATUS

John D. Sullivan, Columbus; Larry G. Moore, Orient, and James K. Taylor, Columbus, all of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Oct. 8, 1980, Ser. No. 194,997

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—551 **34 Claims**



1. In a system for monitoring the performance of operational devices through the use of transducers associated therewith, each said transducer having an output corresponding with a select performance parameter, the improvement comprising:

monitoring apparatus including:

a linear array of indicators, each discretely energizable in response to an input signal;

scale means including linearly disposed graduation indicia aligned generally in parallel with and adjacent to said linear array of indicators for providing a scale level correspondence with each said indicator;

signal testing means responsive to said transducer output for deriving a data signal;

processor means responsive to said data signal and including memory means for retaining a limit datum corresponding with a threshold level selected in association with said select performance parameter for deriving a control output;

decoder means responsive to said control output for deriving a first said input signal for energizing a first said indicator adjacent a said scale means indicia having a graduation value corresponding with a said data signal deriving from said transducer output, and simultaneously deriving a second said input signal for energizing a second said indicator adjacent a said scale means indicia having a graduation value corresponding with a said limit datum;

a hand manipular programming component connected in signal transfer relationship with said processor means, actuable to derive output conditions corresponding with a selected said limit datum; and

said processor means is responsive to said hand manipular programming component output conditions to effect a said decoder means energization of a said indicator in correspondence therewith.

4,399,514

METHOD OF INSPECTING INTERNAL PRESSURES IN SEALED CONTAINERS

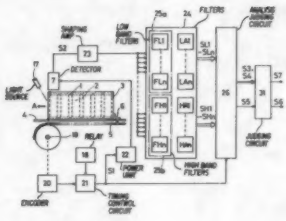
Mikihiko Hamasaki, Kawanishi, and Kozo Oba, Izumi, both of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,770

Claims priority, application Japan, Dec. 26, 1979, 54-173724; Jul. 10, 1980, 55-94790; Oct. 24, 1980, 55-149967

Int. Cl.³ G01L *9/10*; G01M *3/36*

U.S. Cl. 364—558 **3 Claims**



1. A method of inspecting the internal pressures in sealed containers comprising the steps of:

exerting an impulsive force to a metallic end surface of each sealed container;

detecting vibration of the end surface of said sealed container generated by said impulsive force, by means of one of a plurality of vibration detectors;

supplying an output electric signal of said detector to a plurality of band-pass filters having substantially adjacent pass-bands;

comparing the levels of the output signals of said band-pass filters;

selecting two filters through which signals having the highest and second highest levels based on such comparison, pass;

designating the signal passing through the filter having a lower frequency out of said two filters, as a fundamental frequency signal;

selecting the filter having a frequency equivalent to a value obtained by multiplying the frequency of said fundamental frequency signal by a specific numeral from 2 to 3;

designating the signal passing through said last-mentioned filter, as a higher harmonic signal; and

judging said sealed container as defective when said fundamental frequency signal and said higher harmonic signal are applicable to at least one of following conditions;

(a) the level of said fundamental frequency signal is smaller than a predetermined standard level;

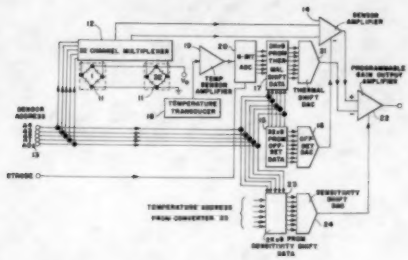
(b) the frequency of said fundamental frequency signal deviates from a predetermined frequency range; and

(c) the ratio of said higher harmonic signal level to said fundamental frequency signal level is larger than a predetermined standard ratio.

4,399,515
SELF-CORRECTING ELECTRONICALLY SCANNED PRESSURE SENSOR

Chris Gross, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1981, Ser. No. 249,304
Int. Cl.³ G06F 15/20
U.S. Cl. 364—571 **6 Claims**



1. In a multiple pressure sensor system, means for correcting thermal errors in the analog outputs of the pressure sensor comprising:

a plurality of pressure sensors;

means including a digital address for sequentially connecting said pressure sensors to an output terminal;

means for producing a voltage proportional to temperature;

analog-to-digital converter means for converting said voltage proportional to temperature to a digital temperature address;

digital storage means for storing the thermal shift correction values generated by each of said pressure sensors throughout the temperature operating range of said pressure sensor system and responsive to said digital sensor address and said digital thermal address for selecting the digital thermal shift value corresponding to the temperature and the pressure sensor connected to said output terminal;

digital-to-analog converter means for converting the selected digital thermal shift value to an analog thermal shift signal;

means for combining said analog thermal shift signal with the output of the corresponding pressure sensor to compensate for the thermal shift of the pressure sensor; and

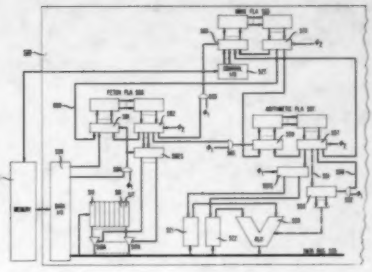
means for providing thermal sensitivity compensations for the different pressure sensor outputs.

4,399,516
STORED-PROGRAM CONTROL MACHINE

Donald E. Blahut, Holmdel; Marc L. Harrison, Morganville; Michael J. Killian, Eatontown, and Mark E. Thierbach, Lincroft, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 10, 1981, Ser. No. 233,143
Int. Cl.³ G06F 9/22
U.S. Cl. 364—716 **10 Claims**

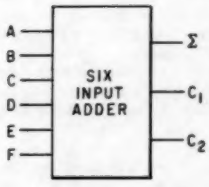
1. An integrated circuit structure including a first logic array having an associated input register for supplying first signals to said first logic array, and a second logic array having an associated output register for receiving second signals from said second logic array, said input and output registers being operative respectively in response to first and second phase clock pulses, clock means for applying clock pulses in said first and second phase and means for applying inputs to said input register, said structure being characterized by control means connected between said output register and said input register responsive to an output from said output register during each second phase clock pulse for controlling modification of selected ones of said second signals received in the output register during the next preceding second phase clock pulse.



4,399,517
MULTIPLE-INPUT BINARY ADDER

Jeffrey A. Niehaus, The Colony, and Kevin M. Ovens, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 19, 1981, Ser. No. 245,480
Int. Cl.³ G06F 7/50
U.S. Cl. 364—784 **7 Claims**



1. In an integrated circuit device, a circuit for adding a plurality of binary inputs of equal weight to generate sum, first carry and second carry output terms representing a 3-bit binary number, the circuit comprising:

first circuit means responsive to the binary inputs for generating a plurality of intermediate output terms, the intermediate output terms including the NAND, NOR and Exclusive OR of first and second binary inputs and the NAND, NOR and Exclusive OR of third and fourth binary inputs;

second circuit means responsive to selected combinations of the intermediate output terms for generating the sum output term;

third circuit means responsive to selected combinations of the intermediate output terms and the binary inputs for generating the first carry output term; and

fourth circuit means responsive to selected combinations of the intermediate output terms for generating the second carry output term.

4,399,518

MONOLITHICALLY INTEGRATED SEMICONDUCTOR CIRCUIT

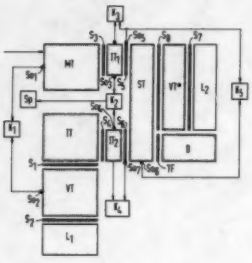
Artur Bardl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 28, 1980, Ser. No. 182,236

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935107

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—45 **19 Claims**



1. Monolithically integrated semiconductor circuit with a signal input addressable by a first signal type, constituting analog signals, and with a signal output delivering a second signal type constituting digital signals, comprising a circuit section for converting the analog signals of the first signal type into the digital signals of the second signal type, said circuit section being a charge transport circuit forming an analog adder, the signal input addressable by an analog signal being connected via a sampler and a low-pass filter to a first MOS capacitor operated as a sample-and-hold member; a second MOS capacitor being connected to a third MOS capacitor connected, in turn, to a charge source, said first MOS capacitor and said third MOS capacitor having respective probes for determining the surface potential and for addressing a first comparator; said first MOS capacitor being connected to a fourth MOS capacitor which, in turn, is connected to said analog adder, said second MOS capacitor being connected to a fifth MOS capacitor which, in turn, is connected to said analog adder; said fourth and said fifth MOS capacitors having surface potentials serving for controlling a second comparator, said fourth MOS capacitor being provided for controlling a third comparator, and said fifth MOS capacitor being provided for controlling a fourth comparator; said fourth and said fifth MOS capacitors having equal area, said area being markedly smaller than that of all of the other MOS capacitors including the MOS capacitors of said analog adder.

4,399,519

DYNAMIC MONOLITHIC MEMORY

Hiroo Masuda, Kodaira, and Katsuhiro Shimohigashi, Musashimurayama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,244

Claims priority, application Japan, Sep. 19, 1979, 54-119403

Int. Cl.³ G11C *7/00, 11/24*

U.S. Cl. 365—149 **16 Claims**

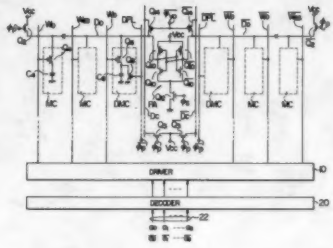
1. A dynamic monolithic memory comprising:

a plurality of data lines;

a plurality of word lines;

a plurality of memory cells provided at the intersections between said data lines and word lines, each memory cell having a capacitance for storing a first or a second voltage and a field-effect transistor for connecting said capacitance to the corresponding data line, said field-effect transistor having a gate electrode connected to said corresponding word line, a first electrode connected to said corresponding data line and a second electrode connected to said capacitance;

means for charging said data lines to a third predetermined voltage before reading the memory cell, said third voltage cooperating with said first and second voltages so that said first and second electrodes are operated during a



memory reading operation as source and drain electrodes, respectively, regardless of whether said capacitance is storing said first or said second voltage; and

a driver means for applying a predetermined selecting voltage to said word line, the difference between said selecting voltage and said third voltage exceeding a predetermined threshold value of said transistor.

4,399,520

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

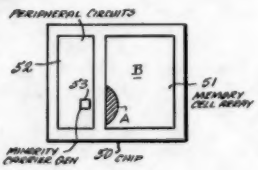
Shoji Arizumi, Tokyo; Makoto Segawa, Yokohama; Hisaaki Maiwa, Kawasaki, and Seishi Okamoto, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 19, 1981, Ser. No. 235,859

Claims priority, application Japan, Feb. 22, 1980, 55-21203; Jun. 27, 1980, 55-87335

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—174 **3 Claims**



1. A semiconductor integrated circuit having a memory made up of individual elements having associated circuit values and a peripheral circuit generating minority carriers which influence some of the elements making up a portion of said memory wherein said elements are formed so that the values of at least one of said circuit elements are set in said portion different from the values in the remainder of said memory so that the effect of the influence is reduced in said portion so stored data, which would be otherwise lost if the values were the same as in the remainder of the memory, is not lost.

4,399,521

MONOLITHIC INTEGRATED CIRCUIT

Hajime Masuda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

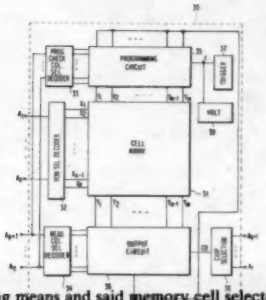
Filed Sep. 26, 1980, Ser. No. 191,116

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—180 **12 Claims**

1. An integrated circuit comprising a plurality of memory

cells each having a PN junction for storing binary coded information in accordance with whether said PN junction is destroyed or not, supplying means for supplying a programming current for destroying said PN junctions, said supplying means having a parasitic capacitance, selecting means for selecting at least one memory cell, transferring means coupled to said



supplying means and said memory cell selected by said selecting means for transferring said programming current to the selected memory cell, and control means coupled to said transferring means for suppressing an accumulation of an undesired charge in said parasitic capacitance, whereby a large current due to said undesired charge is prevented from flowing through said selected memory cell.

4,399,522

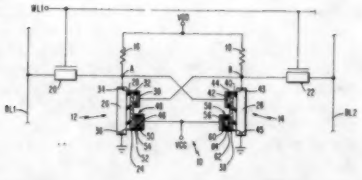
NON-VOLATILE STATIC RAM CELL WITH ENHANCED CONDUCTION INSULATORS

Harish N. Kotecha, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,580

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—185 **12 Claims**



1. A memory system comprising;

first and second cross-coupled transistors, one of said transistors having first and second control gates, a floating gate and a dual charge injector structure disposed between the first control gate and the floating gate,

first and second load elements coupled to said first and second transistors, respectively, forming at least one storage node,

said second control gate being coupled to said storage node, and

means for applying a control voltage to said first control gate.

4,399,523

NON-VOLATILE, ELECTRICALLY ERASABLE AND REPROGRAMMABLE MEMORY ELEMENT

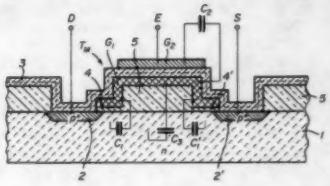
Bernard Gerber, and Jean Fellrath, both of Neuchatel, Switzerland, assignors to Centre Electronique Horloger SA, Neuchatel, Switzerland

Filed Aug. 22, 1980, Ser. No. 180,488

Claims priority, application Switzerland, Aug. 24, 1979, 7711/79; Mar. 24, 1980, 2271/80

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—218 **13 Claims**



1. A non-volatile, electrically erasable and reprogrammable memory element comprising a single p-channel MOS transistor with a polycrystalline silicon floating gate capacitively coupled to a control electrode, wherein,

said polycrystalline silicon floating gate is arranged, at least over a portion of the channel region, on a thin injection-type oxide and, outside the channel region, on a field oxide layer which is substantially thicker;

said control electrode covers said floating gate and is separated from said floating gate by at least one gate oxide layer which is substantially thicker than said injection-type oxide; and

the thickness of said injection-type oxide and said gate oxide is chosen so that said floating gate can be negatively charged by avalanche of the drain-substrate junction and can be discharged by field emission of electrons from said floating gate towards the substrate by applying a negative voltage to said control electrode.

4,399,524

MEMORY PROTECTION SYSTEM

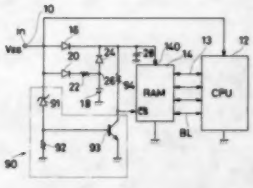
Norio Muguruma, Yao; Mitsuo Morihisa, Nara, and Hideyuki Akao, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1981, Ser. No. 235,621

Claims priority, application Japan, Feb. 18, 1980, 55-20010[U]

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—229 **1 Claim**



1. A memory protection system comprising:

a volatile memory including a chip selection terminal and an output terminal;

load means connected to said output terminal of said volatile memory;

a main power supply terminal for supplying power to said volatile memory and said load means;

an auxiliary power source for supplying power to said volatile memory when a voltage level derived from said main

power supply terminal is lower than a preselected level; and

voltage level detection means for developing a disabling signal to said chip selection terminal of said volatile memory when the voltage level derived from said main power supply terminal becomes lower than said preselected level, thereby electrically disconnecting said load means from said volatile memory when said volatile memory is supplied with power from said auxiliary power source, said voltage level detection means including,

a Zener diode connected to said power supply terminal, said Zener diode being placed in a nonconductive condition when the voltage level derived from said main power supply terminal becomes lower than said preselected level;

a transistor connected to said chip selection terminal of said volatile memory for applying an enabling signal in a normal operation mode; and

means for placing said transistor in the nonconductive condition when said Zener diode is placed in said nonconductive condition, thereby applying said disabling signal to said chip selection terminal of said volatile memory.

4,399,525

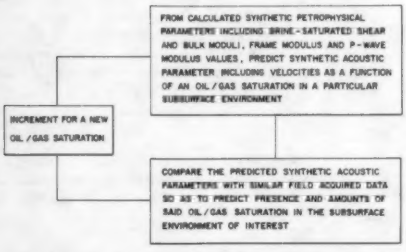
METHOD FOR INTERPRETING WELL LOG RECORDS TO YIELD INDICATIONS OF GAS/OIL IN AN EARTH FORMATION SUCH AS A SANDSTONE, LIMESTONE, OR DOLOSTONE

Don D. Thompson, Corona Del Mar; Robert J. S. Brown, Fullerton, and Richard J. Runge, Anaheim, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 82,382, Oct. 5, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,540

Int. Cl.³ G01V *1/30*

U.S. Cl. 367—75 **21 Claims**


FROM CALCULATED SYNTHETIC PETROPHYSICAL PARAMETERS INCLUDING BRINE-SATURATED SHEAR AND BULK MODULI, FRAME MODULUS AND P-WAVE MODULUS VALUES, PREDICT SYNTHETIC ACOUSTIC PARAMETER INCLUDING VELOCITIES AS A FUNCTION OF AN OIL/GAS SATURATION IN A PARTICULAR SUBSURFACE ENVIRONMENT
INCREMENT FOR A NEW OIL/GAS SATURATION
COMPARE THE PREDICTED SYNTHETIC ACOUSTIC PARAMETERS WITH SIMILAR FIELD ACQUIRED DATA SO AS TO PREDICT PRESENCE AND AMOUNTS OF SAID OIL/GAS SATURATION IN THE SUBSURFACE ENVIRONMENT OF INTEREST

1. System for resolving event characteristics of an acoustic log of a first well so as to determine gas/oil fractions in a selected zone of an earth formation by creating synthetic gas-indicating characteristics from petrophysical parameters corresponding to said selected zone of interest associated with a second well of substantially zero hydrocarbon potential, comprising:

(a) means for obtaining said acoustic log for said first well;

(b) means for determining actual compressional velocity and density values of said zone of interest based on field information associated with said second well in which selection of a zonal lithology from a group comprising sandstone, limestone and dolostone occurs;

(c) a digital programmable computer for:

(i) predicting brine-saturated bulk and shear moduli (Kw* and Gw*) using empirical equations containing coefficients and said P-wave modulus value (Pw*), said coefficients varying in empirical fashion as a function of at least porosity, pressure and temperature;

(ii) estimating a frame modulus value (Ka) of said zone of interest using a relationship involving Kw*, Kb, Km and ϕ, where Kw* is brine-saturated bulk density of the aggregate, Kb is the bulk modulus of brine, and Km is the bulk modulus of the solid material making up the zone of interest and ϕ is porosity;

(iii) predicting bulk modulus K* values with the gas/oil present in said zone of interest in differing amounts using a relationship involving Ka of step (ii), Km, ϕ, Kf, where Kf is the bulk modulus of a liquid-gas mixture of a selected oil/gas gravity and saturation;

(iv) assuming Gw* is equal to Ggas/oil*, predicting P-wave modulus values of the zone with gas/oil present (Pgas/oil*) based on the relationship

$$P_{gas/oil^*} = K_{gas^*} + (4/3)G_{w^*}$$

(v) predicting acoustic velocities within said zone from said P-wave modulus values (Pgas/oil*) of step

(iv) as a function of said selected gas/oil gravity and saturation; and

(d) comparitor means comparing said predicted velocities or derivations thereof with actual velocities or derivations thereof, of (a) associated with said acoustic log of said first well to predict presence and amounts of gas/oil fractions in said zone of interest at said first well.

4,399,526

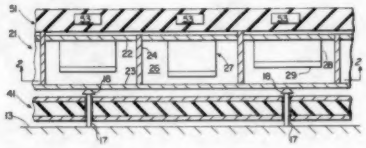
ACOUSTIC BAFFLE FOR HIGH-PRESSURE SERVICE, MODULAR DESIGN

John J. Eynck, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1981, Ser. No. 228,848

Int. Cl.³ H04R *17/00*

U.S. Cl. 367—149 **7 Claims**



1. An acoustic array for application to submerged hull surfaces comprises:

an acoustic baffle for attachment to the hull to reduce the transmission of shipboard noise, said acoustic baffle including layers of viscoelastic material disposed between layers of rigid material;

an acoustic conditioning module connected to said acoustic baffle for coherently reflecting incident acoustic signals so that the reflected acoustic signals reinforce the incident acoustic signals, said conditioning module including spaced coverplates, a plurality of spacer elements extending between said coverplates to form sealed chambers therebetween and a plurality of damping elements positioned in said chambers and connected to one of the coverplates; and

an outer layer connected to said acoustic conditioning module, said outer layer contains a plurality of hydrophone units and said outer layer is formed of material having an impedance which approximates the impedance of seawater;

where said rigid layers are bonded to the opposite faces of the viscoelastic layers to form a plurality of modular units, and said modular units being bonded together with flexible bond layers so that a flexible bond layer is disposed between the rigid layers of the adjacent modular units; and

wherein the viscoelastic layers are formed with a plurality of open cells arranged in a predetermined pattern with the pattern of open cells in adjacent viscoelastic layers being offset from each other so that the load bearing portions of

one viscoelastic layer overlap the open cells of the adjoining viscoelastic layer.

4,399,527

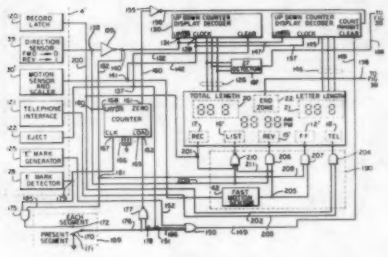
DICTATION DISPLAY DEVICE

Theodore Titus, IV, Tucker, and Julius B. Bagley, Atlanta, both of Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Division of Ser. No. 27,990, Apr. 9, 1979, Pat. No. 4,352,173. This application Apr. 27, 1981, Ser. No. 257,555

Int. Cl.³ G11B *17/00, 3/82;* H04M *11/10*

U.S. Cl. 369—28 **2 Claims**



1. In a dictation recording system including a dictate station, said dictate station including means for generating an end signal and a means for recording on a record medium said end signal delimiting the end of a segment of dictation, motion signal means for providing a motion signal in response to an increment of said record medium moving past a predetermined reference point, a transport for selectively moving said record medium in a forward direction and a reverse direction, and an end mark detector for detecting a previously-recorded end signal and providing a detected end signal,

an improved display apparatus for said dictation station for maintaining a visual representation of the location of said reference point within the present one of a plurality of segments of dictation on said record medium, comprising:

direction detecting means for providing a forward signal when said record medium is moving in said forward direction and a reverse signal when said record medium is moving in said reverse direction;

up/down counting means responsive to said motion signal, said forward signal, and said reverse signal, said counting means being incremented upon each concurrence of said motion signal and said forward signal and decremented upon each concurrence of said motion signal and said reverse signal;

display means connected to said counting means for displaying the count maintained by said counting means as said visual representation of the location of said reference point within the present dictation segment; and

control means responsive to said detected end signal and said reverse signal for rendering said counting means unresponsive to increment and decrement upon the exit from said present one of a plurality of segments of dictation when moving said record medium in said reverse direction,

said inhibit means being further responsive to said detected end signal and said forward signal for rendering said counting means responsive to increment and decrement upon the reentry of said present one of said plurality of segments of dictation when moving said record medium in said forward direction,

whereby said display means is rendered inoperative to display the location of said reference point upon the exit in the reverse direction from the present segment of dictation and until the return in the forward directon to the present segment.

4,399,528

AUTOMATIC EJECT APPARATUS FOR A SELF-CONTAINED RECORD PLAYER

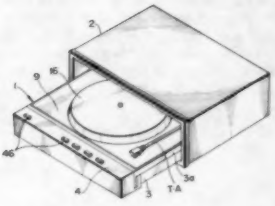
Kiyoshi Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1981, Ser. No. 334,262

Claims priority, application Japan, Dec. 29, 1980, 55/186552

Int. Cl.³ G11B *1/00, 17/00*

U.S. Cl. 369—77 **10 Claims**



1. In a record player of the type having a housing, a carrier movable into and out of said housing, a turntable mounted on said carrier and a tone arm pivotably supported on said carrier and movable between a raised position and a lowered position; apparatus comprising:

carrier drive means energizable to bi-directionally drive said carrier into and out of said housing between withdrawn and retracted positions, respectively;

sense means for sensing when said carrier is in its withdrawn and retracted positions, respectively;

tone arm drive means energizable to pivotally drive said tone arm to and from a reset position;

tone arm position detecting means for detecting when said tone arm is in its raised and lowered positions, respectively;

switch means for initiating a carrier movement operation; and

drive control means responsive to said switch means to energize said carrier drive means in accordance with the position sensed by said sense means, whereby said carrier drive means drives said carrier into said housing when said sense means senses that said carrier is in its withdrawn position, and said carrier drive means drives said carrier out of said housing when said sense means senses that said carrier is in its retracted position and said tone arm position detecting means detects that said tone arm is in its raised position; said drive control means concurrently energizing said tone arm drive means to pivot said tone arm to its reset position.

4,399,529

OPTICAL DEVICE FOR RECORDING AND READING ON A DATA CARRIER

Dominique Leterme, and Jean P. Le Merer, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 27, 1981, Ser. No. 268,078

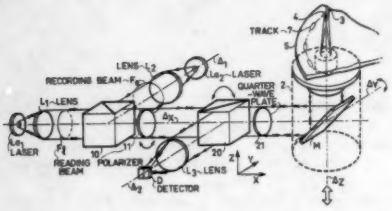
Claims priority, application France, May 28, 1980, 80 11801

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—110 **8 Claims**

1. An optical device for recording and reading a data carrier, of the type comprising two fixed radiant-energy sources of the semiconductor laser type having a predetermined wavelength, a first beam for reading data recorded on said data carrier being emitted by the first source aforesaid and a second beam for recording data on said data carrier being emitted by the second source aforesaid, wherein recording and reading are performed by means of a recording-reading head rigidly fixed to a moving system which is displaceable with respect to the data carrier and comprising an objective for focusing the reading and recording beams respectively on predetermined zones

of the data carrier, said beams being also reflected from said predetermined zones, said optical device being further provided with first optical means consituting a composite radiant energy source comprising said first and second fixed semiconductor-laser sources which are each provided with stigmantic means for making said beams parallel, said sources being linearly polarized in first and second orthogonal directions and adapted to emit beam components in said first and second emission directions which are parallel respectively to first and second axes, said beam components being passed through an optical element of refractive material having a preferential optic axis parallel to one of said directions of polarization, the incident beam emitted by one of said sources and having a direction of polarization parallel to the preferential optic axis being transmitted by said optical element in a direction parallel to said first axis without modification whilst the incident beam emitted by the other source aforesaid is totally reflected in the



same direction by said optical element, said optical device being further provided with second optical means placed on said first axis and comprising a second optical element of refractive material which also has another preferential optic axis, said second optical element being intended to transmit all or part of the composite beam in a direction parallel to said first axis, the direction of polarization of the emergent composite beam being parallel to the other optic axis aforesaid, provision being made for a quarter-wave plate having the function of converting the linear polarization to circular polarization, said polarized composite beam being transmitted to said recording-reading head, and for a convergent optical system placed on a third axis, said composite beam being totally reflected in a direction parallel to said third axis by said second optical element after reflection from the data carrier, the function of the convergent optical system aforesaid being to focus the two components of said beam to two separate and distinct points of impact on an optoelectronic detection device.

4,399,530

METHOD AND APPARATUS FOR CODING AND DECODING BINARY DATA

Jean-Pierre Demange, Strasbourg, and Pierre Lagarde, Dingsheim, both of France, assignors to La Telephonie Industrielle et Commerciale, Strasbourg, France

Filed Apr. 13, 1981, Ser. No. 253,547
Claims priority, application France, Apr. 15, 1980, 80 08666
Int. Cl.³ H04L *5/16*
U.S. Cl. 370—31 **9 Claims**

1. Process of coding and decoding two binary signals of which one is a clock signal and the other a data signal which can symbolically take the value 0 or 1 on a pair of conductors which comprises:

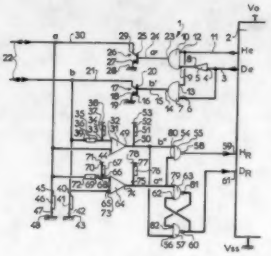
for coding:

placing a first line of the pair of conductors in logic state 1 when the two binary signals are themselves simultaneously in logic state 1, otherwise it remains in logic state 0,

placing a second line of the pair of conductors in logic state 1 when one of the signals is in logic state 1 while the other is in logic state 0, otherwise it remains in logic state 0.

for decoding:

placing the decoded output of the clock signal in logic state 1 when the two lines of the pair of conductors are simultaneously in logic state 1, otherwise said output is in logic state 0, and



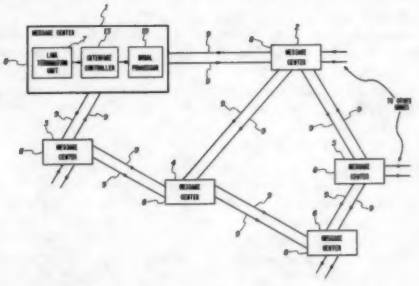
modifying the state of the decoded output of the data signal at the time of passage from logic state 1 to logic state 0 of either one of the coded signals of the lines of the pair of conductors.

4,399,531

DISTRIBUTED DIGITAL DATA COMMUNICATIONS NETWORK

Johannes Grande, Richardson, and Raymond Bittel, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1980, Ser. No. 191,969
Int. Cl.³ H04J *6/00*; H04Q *11/04*
U.S. Cl. 370—60 **12 Claims**



1. A distributed digital data communication network, comprising:

a plurality of nodes geographically separated;

a plurality of full duplex data lines connected to the plurality of nodes such that each node is connected to its neighboring nodes by a data link between each of the neighboring nodes;

flood search means for propagating a first message through the digital data communication network from an originating node that is a member of the plurality nodes to an address homed at a destination node that is also a member of the plurality of nodes; and

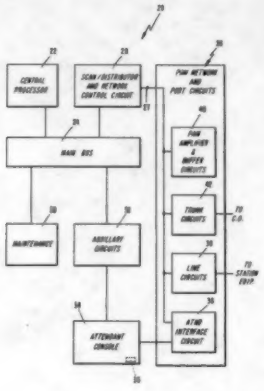
shortest time delay path means for propagating a response message over the shortest time delay path, in response to the first message, from the destination node to the originating node via a data link that each node of the plurality of nodes first received the first message on.

4,399,532

METHODS OF AND SYSTEMS FOR MONITORING A FIRST CALL CONNECTION WHILE EFFECTING THE ESTABLISHMENT OF A SECOND CALL CONNECTION

Jamie J. Marschner, Denver, and Rodney R. Maxon, Boulder, both of Colo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,327
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—62 15 Claims



1. A method of monitoring at least a first call connection in a switching system while effecting the establishment of a second call connection, which comprises the steps of:

establishing a first two-way transmission connection between an attendant facility and a first call to be served by the system;

converting the first two-way transmission connection to a one-way listen-only connection by the attendant facility;

establishing a second two-way transmission connection between the attendant facility and a second call to be served by the system; and

monitoring the listen-only connection while simultaneously effecting the establishment of the second call connection associated with the second two-way transmission connection.

4,399,533

DUAL RAIL TIME AND CONTROL UNIT FOR A T-S-T-DIGITAL SWITCHING SYSTEM

Nathaniel Simmons; Stig Magnusson, both of Phoenix; Sergio E. Puccini, Scottsdale, all of Ariz.; Donald W. McLaughlin, Naperville, and David J. Stelte, Lombard, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 23, 1980, Ser. No. 219,548
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—63 8 Claims

1. In a time-space-time switching system including first and a second buses, each bus transmitting a plurality of PCM voice samples to a switching network, said buses connected between said network and subscriber interface equipment, said switching network comprising:

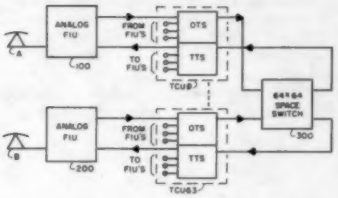
first and second space switching means;

first and second originating time switching means connected respectively to said first and second space switching means and connected to said subscriber interface equipment via said first and second buses, each of said originating time switching means operated to switch said PCM voice samples to said first and second space switching means respectively;

first and second terminating time switching means, said first and second terminating time switching means connected respectively between said first and said second space switching means and said subscriber interface equipment, said first and second terminating time switching means operating to switch said PCM voice samples from said first and second space switching means to said subscriber interface equipment;

each of said terminating time switching means including:

memory means connected between said first and second space switching means and said subscriber interface equipment, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously in corresponding time slots for storing said PCM samples;



gating means connected respectively between said first and second space switching means and each of said memory means of said first and second terminating time switching means, each of said gating means operating respectively in response to said memory means of said terminating time switching means to transmit said PCM samples from said first and second space switching means to said first and second memory means for each of said plurality of PCM samples; and

said first and said second memory means further being operable so that said PCM samples from said first space switching means are switched through said second terminating time switching means or alternatively to switch said PCM samples from said second space switching means through said first terminating time switching means.

4,399,534

DUAL RAIL TIME AND CONTROL UNIT FOR A DUPLEX T-S-T-DIGITAL SWITCHING SYSTEM

Nathaniel Simmons; Stig Magnusson, both of Phoenix; Sergio E. Puccini, Scottsdale, all of Ariz.; Donald W. McLaughlin, Naperville, and David J. Stelte, Lombard, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 23, 1980, Ser. No. 219,549
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—63 9 Claims

1. In a duplex time-space-time switching system including first and second parallel switching networks, said switching system transmitting a plurality of PCM voice samples over each of said first and second switching networks from a first to a second telephone subscriber via subscriber interface equipment, each of said subscribers being connected to each of said first and second parallel switching networks, said switching system comprising:

synchronization means;

each of said parallel switching networks including:

first and second buses connected to said subscriber interface equipment;

first and second space switching means connected to said synchronization means;

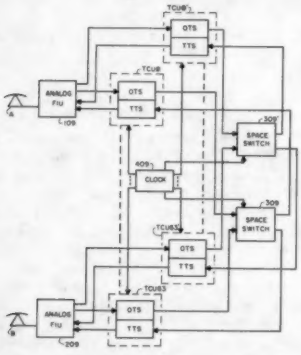
first and second originating time switching means connected respectively to said first and second space switching means, connected to said synchronization means and connected to said subscriber interface equipment via said first and second buses, each of said originating time switching means operating to switch said PCM voice samples from said subscriber interface equipment;

first and second terminating time switching means, said first and second terminating time switching means being connected respectively between said first and second space switching means, and said subscriber interface equipment and connected to said synchronization means, each of said terminating time switching means operating to switch said PCM voice samples from said first and second space switching means to said subscriber interface equipment;

each of said terminating time switching means including:

memory means connected between said first and second space switching and said subscriber interface, said first and second memory means being interconnected so that said first and said second memory means are written into simultaneously in sequential time slots with said PCM samples transmitted via said first and second space switching means;

gating means connected respectively between said first and



second space switching means and each of said memory means of said first and second terminating time switching means, each of said gating means operating respectively in response to said memory means of said terminating time switching means to transmit said PCM samples from said first and second space switching means to said first and second memory means;

said first and said second memory means further operating so that said PCM samples from said first space switching means may be switched through said second terminating time switching means to said subscriber interface equipment or alternatively said PCM samples from said second space switching means may be switched through said first terminating time switching means to said subscriber interface equipment;

said switching system further including:

said synchronization means operating to simultaneously control said operation of said first and second originating time switching means of said first switching network synchronously with said first and second originating time switching means of said second switching network;

said first and second space switching means of said first switching network simultaneously operating with said first and second space switching means of said second switching network in response to said synchronization means and to said operation of each said first and second originating time switching means; and

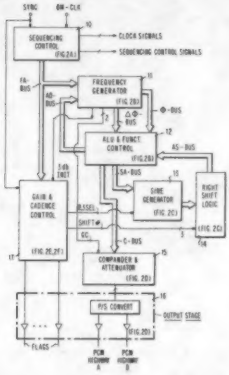
said first and second terminating time switching means of said first switching network simultaneously operating with said first and second terminating time switching of said second switching network in response to said synchronization means and to said operation of each said first and second space switching means.

4,399,535

DIGITAL TONE GENERATOR

Gary D. Southard, Coral Springs, Fla., assignor to Siemens Corporation, Iselin, N.J.

Filed Jun. 18, 1981, Ser. No. 275,146
Int. Cl.³ H04J 3/12
U.S. Cl. 370—110.2 **21 Claims**



1. A digital tone generator adapted to be connected to a digital telecommunication system for simultaneously generating during a tone generator operation cycle digital encoded instantaneous amplitude values of a variety of continuous and of cyclically repeated discontinuous tone signals each composed of at least one frequency component and assigned to a separate tone channel of a tone highway representing a time-division multiplexed serial data transmission line, said digital tone generator comprising:

(a) sequencing control means for generating a consecutively incremented and cyclically repeated reference address signal directing the course of said operating cycle;

(b) amplitude control means for generating amplitude control signals determining varying mean amplitude values of discontinuous digital tone signals such that stepwise adjusting of a mean amplitude value takes place coincidentally with the instantaneous amplitude going through zero value and in accordance with a predetermined attenuation curve at the commencement of the rising and trailing ends of a pulse of each discontinuous digital tone signal, said amplitude control means including at least one input connected to receive said reference address signal, storage means for storing steady and variable amplitude control information, processing means for producing said amplitude control signals, and at least one input;

(c) amplitude value generating means including a phase value generator connected to receive said reference signal for producing an instantaneous, frequency dependent phase value signal constituting a current sine address signal; and including a single sine wave generator incorporating a sine wave memory in form of a random access memory provided with a multiplicity of memory locations each permanently storing one of consecutive sine amplitude values having a finite difference from each other such that these values represent a continuous part of a single sine wave form, said memory for storing sine wave amplitude values having address inputs connected to receive the sine address signal

and read outputs wherein said amplitude value generating means are further connected to receive said amplitude control signals for generating a digital encoded signal representing one of said instantaneous amplitude values; and

(d) output means connected to receive said digital encoded signals for transmitting said digital encoded signal onto said tone highway in synchronization with the cyclical occurrence of the assigned tone channel.

4,399,536

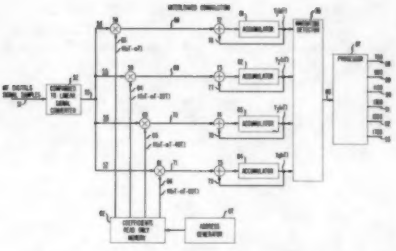
CONVOLUTION FILTER ARRANGEMENT FOR DIGITAL MULTIFREQUENCY RECEIVER

Reinhard Metz, Oswego, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 2, 1981, Ser. No. 307,842

Int. Cl.³ H04J 3/12

U.S. Cl. 370—110.3 **20 Claims**



1. A digital convolution arrangement comprising

means for supplying a plurality of digital impulse response signal samples representative of an impulse response of a bandpass filter, each of said signal samples being delayed by a predetermined time period from each other said signal sample,

a plurality of digital convolution circuits, each of said circuits being responsive to a receipt of input digital signals representative of sequential samples of an analog tone signal waveform and of one of said plurality of digital impulse response signal samples for generating a convolution output data signal, and

means cooperating with said circuits for accumulating each of the generated convolution output data signals.

4,399,537

CONTROL CIRCUIT AND FUEL BURNER INCORPORATING A CONTROL CIRCUIT

Gregory E. Jones, Solihull, England, assignor to British Gas Corporation, London, England

Filed Feb. 24, 1981, Ser. No. 237,765

Claims priority, application United Kingdom, Nov. 6, 1980, 8035736

Int. Cl.³ G06F 11/00

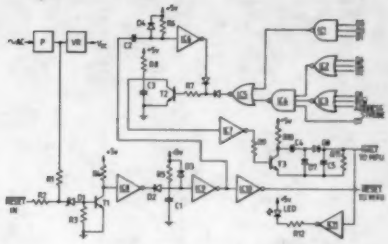
U.S. Cl. 371—14 **5 Claims**

1. A fail-safe supervisory system for a control computer which generates repetitively a set of predetermined signals indicative of computer operation, comprising:

first input means responsive to the set of signals repetitively generated by said computer to produce trigger pulses based thereon;

resettable monostable circuit means responsive to said trigger pulses for producing an alternating signal when the frequency of said trigger pulses is below a first predetermined level; and

diode pump circuit means responsive to said alternating signal for producing an output signal coupled to said computer and allowing the computer to operate when the



frequency of the alternating signal is above a second predetermined level lower than said first predetermined level.

4,399,538

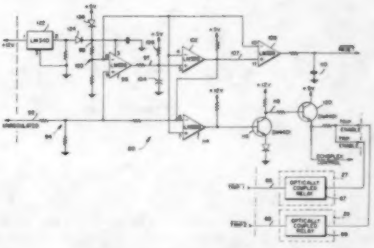
CONTROL SYSTEM FOR INHIBITING PROCESSING COMMUNICATIONS

Gary H. Cholakian, Norwalk; Arthur Rubinstein, East Norwalk, and John H. Steinmetz, Norwalk, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 30, 1981, Ser. No. 258,869

Int. Cl.³ G06F 11/30

U.S. Cl. 371—66 **14 Claims**



1. A control system for selectively controlling communications signals on signal lines connecting a transmitting means powered by a power supply, and a device powered by a second power supply the control system including monitoring means operatively connected to the power supply, the monitoring means including means for detecting a transient power state, the detecting means generating a signal in response to a detected transient power state, and inhibiting means, the inhibiting means receiving the detecting means signal and in response thereto inhibiting signal level changes on said lines, whereby spurious communications signal transmissions during transient power states are inhibited.

4,399,539

AUTO-IONIZATION PUMPED ANTI-STOKES RAMAN LASER

Jonathan C. White, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 9, 1982, Ser. No. 416,381

Int. Cl.³ H01S 3/30

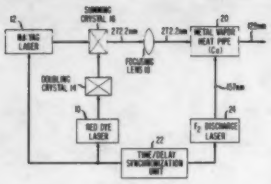
U.S. Cl. 372—3 **5 Claims**

1. An auto-ionization pumped anti-Stokes Raman laser comprising

a Raman lasing medium including a ground state, an intermediate state, and at least one metastable state of an ion;

a first lasing source capable of creating a transition from the

ground state of the Raman lasing medium to a predetermined level above a metastable state of said Raman lasing medium wherein said Raman lasing medium immediately ionizes and falls to said metastable state; and



a second lasing source capable of creating a transition from said metastable state to a predetermined region near said intermediate state, thereby creating a Raman lasing output from said predetermined region to said ground ionic state.

4,399,540

TUNABLE LASER OSCILLATOR

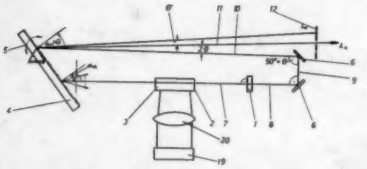
Hermann Bücher, Göttingen, Fed. Rep. of Germany, assignor to Lambda Physik Gesellschaft zur Herstellung von Lasern mbH & Co. KG, Göttigen, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,806

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918863

Int. Cl.³ H01S *3/111*

U.S. Cl. 372—20 **11 Claims**



1. A tunable laser oscillator with a broadband emitting and wavelength tunable laser medium, comprising: an optical resonator with means for setting the wavelength of the laser radiation; means in said resonator for spectral filtering and for producing a spectrally purer emitted laser radiation; aperture means mounted in the path of the radiation from said means for spectral filtering for stopping stray light and passing only spectrally filtered radiation; said means for setting the wavelength of the laser radiation also forming said means for spectral filtering and for producing the spectrally purer emitted laser radiation; and optical means for feeding back the radiation leaving the resonator on to said means for spectral filtering, said means for setting the wavelength of the laser radiation comprising a single device with said means for spectral filtering so that synchronization of said means for setting the wavelength in accordance with said means for spectral filtering is avoided.

4,399,541

LIGHT EMITTING DEVICE PACKAGE HAVING COMBINED HEATER/COOLER

Tibor F. I. Kovats, Ottawa; Tibor F. Deveryi, and Christopher M. Look, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Quebec, Canada

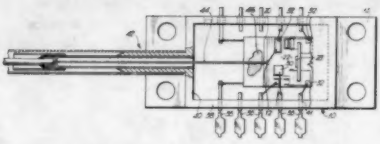
Filed Feb. 17, 1981, Ser. No. 234,676

Int. Cl.³ H01S *3/04*

U.S. Cl. 372—36 **12 Claims**

1. An electro-optic package comprising:

a housing containing a thermoelectric device, a thermally conducting block contacting a thermoelectric device, and a light emitting device and a mass of fusible alloy supported on the block, the light emitting device spaced from the mass of fusible alloy, the thermoelectric device operable in one mode when a voltage of one polarity is applied thereto to heat and thereby melt the fusible alloy and operable in another mode when a voltage of reverse polarity is applied thereto to cool the light emitting device.



4,399,542

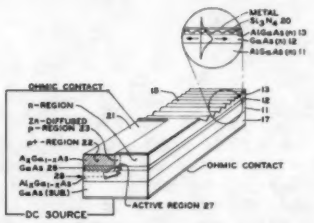
TRANSVERSE JUNCTION STRIPE LASER WITH DISTRIBUTED BRAGG REFLECTORS

Hideo Kawanishi, Machida, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 2, 1981, Ser. No. 239,845

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—47 **3 Claims**



1. A transverse junction stripe (TJS) laser having thereon a distributed Bragg reflector including a layer of GaAs comprising a heavily doped p-GaAs active region and a lightly doped n-GaAs region which acts as a low loss optical passive waveguide for laser light emitted in the heavily doped p-region, wherein the layer of GaAs is sandwiched between layers of $Al_xGa_{1-x}As$, and wherein the sandwiched layers are elongated and the heavily doped p-GaAs active region is located intermediate a lightly doped n-GaAs region on either end and wherein two distributed Bragg reflectors are etched on the surface of the $Al_xGa_{1-x}As$ layer in the proximity of the light doped n-GaAs regions, and a pair of ohmic contacts thereon to provide for energization of the TJS laser.

4,399,543

LINEAR OUTPUT COUPLER FOR A HIGH POWER OPTICAL RING RESONATOR

Kurt E. Oughstun, Marlborough, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1981, Ser. No. 239,307

Int. Cl.³ H01S *3/05*

U.S. Cl. 372—95 **4 Claims**

1. An unstable optical resonator comprising:

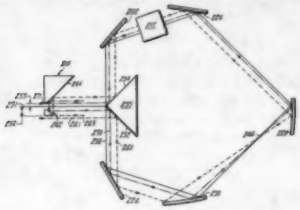
a gain medium with pumping means therefor;

a mirror means for directing optical radiation in forward and reverse traveling modes along a ring path traversing said gain medium, said ring path including an optic axis;

first mirror means for coupling radiation including a wedge mirror having an opening angle of substantially 90° and forward and reverse faces oriented 45° with respect to said optic axis and disposed on one side of said axis, said for-

ward and reverse faces being oriented to couple radiation in said forward and reverse modes along forward and reverse coupling paths at right angles to said optic axis, whereby coupled radiation in said forward and reverse modes is coupled out of said ring path;

second mirror means for coupling radiation including an inverted wedge mirror having a first face parallel to said



forward face and a second face parallel to said reverse face, said first and second faces being of predetermined size and disposed at predetermined positions along said forward and reverse coupling paths such that predetermined fractions of said coupled radiation are deflected from said coupling paths and reflected back toward said wedge mirror and about said ring path.

4,399,544

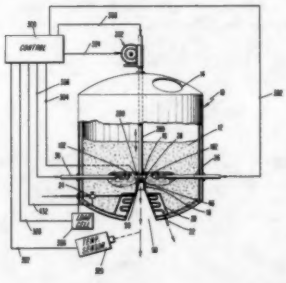
HIGH TEMPERATURE ELECTRONIC FURNACE APPARATUS AND METHODS OF OPERATION

George J. Monaghan, Wayne, Pa., assignor to Energy Fibers Int'l. Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 163,489, Jun. 27, 1980, abandoned. This application Sep. 17, 1981, Ser. No. 303,172

Int. Cl.³ C03B *5/02*; H05B *3/60*

U.S. Cl. 373—35 **24 Claims**



1. A melting furnace comprising:

(a) a vessel for receiving product to be melted, said vessel having means for defining a product exit orifice;

(b) a plurality of primary electrode means for defining primary current paths adjacent said orifice;

(c) control electrode means for defining a current path to said means for defining; and

(d) circuit means for energizing said primary electrode means with multiphase current and for time-sharing said multiphase current with said control electrode means.

4,399,545

METHOD OF LOWERING ELECTRODES OF AN ELECTRIC-ARC FURNACE

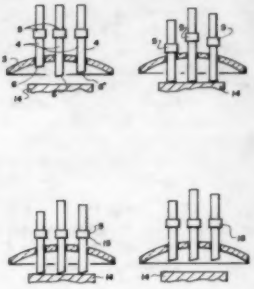
Lothar Harmsen; Friedhelm Vennmann, and Jürgen Zieschang, all of Lingen, Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,459

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023052

Int. Cl.³ H05B *7/10*

U.S. Cl. 373—94 **6 Claims**



1. A method of lowering graphite electrodes of the type having free lengths and electrode clamps clamped about the electrodes, the electrodes being supported by vertically displaceable electrode holders being extended through the cover of an electric-arc furnace, comprising the steps of, initially, laterally swinging the furnace cover completely away from the furnace and over stop means against which each electrode is engageable for setting a free length of each electrode below each electrode clamp to a length which insures a stable electric arc, disengaging the electrode clamps from the electrodes, and adjusting the free lengths of the electrodes below the electrode clamps to the lengths which insure a stable electric arc using the stop means.

4,399,546

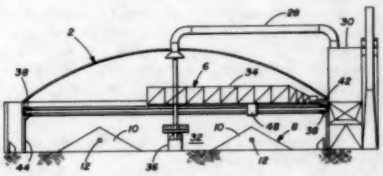
SILICON CARBIDE FURNACE

James D. Phillips, Lewiston, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 79,763, Sep. 28, 1979, abandoned. This application Jul. 15, 1981, Ser. No. 283,696

Int. Cl.³ H05B *3/36*; F27D *3/06*

U.S. Cl. 373—115 **10 Claims**



7. A silicon carbide maufacturing plant comprising:

a dome defining a non-combustible enclosure and having track means circumferentially connected to the inside surface of the side walls of the dome;

an electrical power source;

a free-standing pile of silicious and carbonaceous material located within the enclosure and being shaped in a broken

ring configuration to define a centrally located circular working space;

a source of electrical power including a pair of spaced electrodes;

a resistance core shaped in a broken ring configuration to provide spaced end points and being horizontally inserted within the pile of material, with one of said electrodes being connected to one of said end points and the other of said electrodes being connected to the other of said end points, with electrical current being supplied from said electrical power source through said electrodes to said resistance core to heat said material; and

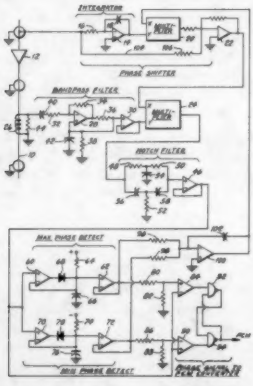
material handling means for loading said pile of material in said broken ring-like configuration including support means located at the center of said working space and a stacking device having one end rotatably mounted on said support means and including a discharge member for discharging said material as said device is rotated to form said broken ring pile, the other end of said stacking device being supported by said track means for relative movement between said device and said dome.

4,399,547

RECEIVER OF PULSED PHASE MODULATED SIGNALS

Herbert E. Moore, Pasadena, and Thomas E. Flanders, Houston, both of Tex., assignors to General Electric Co., Philadelphia, Pa.

Filed Nov. 2, 1981, Ser. No. 317,117
Int. Cl.³ H03K *9/06*
U.S. Cl. 375—83 **5 Claims**



1. A receiver of pulsed phase modulated signals carried by an alternating power line comprising:

an integrator for receiving a sinusoidal voltage reference in phase with the voltage on the power line and for producing a sinusoidal voltage, phase shifted 90 degrees;

a first multiplier having as one input said phase shifted voltage and as a second input a direct current voltage representative of the deviation of signals processed from a desired average;

said first multiplier producing said phase shifted voltage modified in amplitude;

a summing amplifier having as an input both the output produced by said multiplier and the sinusoidal voltage reference;

said summing amplifier producing a corrected sinusoidal voltage output;

a current transformer producing a sinusoidal current in phase with the current on said power line;

a second multiplier having as a first input said corrected sinusoidal voltage, and as a second input said sinusoidal current;

said second multiplier producing a direct current pulse of a maximum amplitude when a reactance is switched onto said power line and a minimum amplitude when said reactance is switched off said power line;

integrating means receiving and integrating the difference between said maximum and minimum direct current pulses and for producing the direct current voltage to be supplied to said first multiplier; and

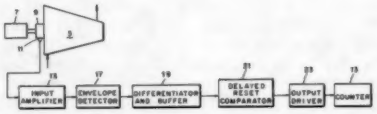
detecting means for receiving said maximum and minimum amplitude pulses and producing a pulse code modulated output.

4,399,548

COMPRESSOR SURGE COUNTER

Kimberly N. Castleberry, Harriman, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 13, 1981, Ser. No. 253,625
Int. Cl.³ G01M *7/00*
U.S. Cl. 377—16 **4 Claims**



1. A surge counter in combination with a rotating compressor, comprising:

vibration sensing means for generating an analog signal indicative of vibration of said rotating compressor;

an amplitude envelope monitoring means for generating an output rate signal proportional to the rate of change of the amplitude envelope of said analog signal;

delayed reset comparator circuit means responsive to a preselected level of said output rate signal for generating a count increment signal when said output rate signal exceeds said preselected level and remaining non-responsive for a delay period corresponding to a known period of surge duration in said rotating compressor; and

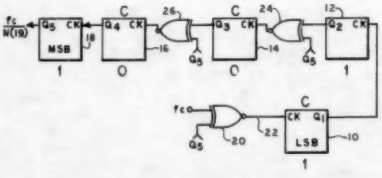
a counter connected to receive said count increment signal.

4,399,549

ODD NUMBER FREQUENCY DIVISION WITH SYMMETRICAL OUTPUT

Gopal K. Srivastava, Buffalo Grove, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 18, 1981, Ser. No. 293,918
Int. Cl.³ H03K *21/36, 23/24*
U.S. Cl. 377—108 **5 Claims**



1. In a chain of dividers, each having a clock input and an output, a method of dividing a clock signal by an odd number N to obtain a symmetrical, divider output, comprising:

associating with each divider a binary digit one or zero so that the combination of the digits represents the number N in binary form;

selecting as controlled dividers the divider associated with the least significant digit and dividers associated with each binary zero digit;

selecting as uncontrolled dividers the divider associated with the most significant digit and the remaining dividers associated with each binary one digit;

exclusive NORing the output of the divider associated with the most significant digit with the clock signal to provide a first control signal;

applying the first control signal to the clock input of the divider associated with the least significant digit;

for every other controlled divider, exclusive NORing the output of the divider associated with the most significant digit with the output of an immediately preceding divider in the chain, and applying the resultant control signal to the clock input of the controlled divider; and

coupling to the clock input of each uncontrolled divider to the output of an immediately preceding divider,

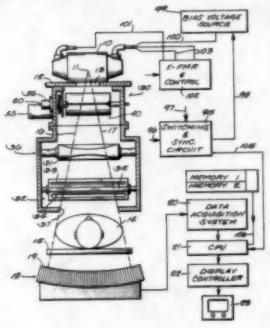
whereby the divider associated with the most significant digit develops a symmetrical output whose frequency is N times lower than the frequency of the clock signal.

4,399,550

SPINNING FILTER FOR X-RAY APPARATUS

Robert B. Hauck, Delafield; Floyd L. Gray, Hales Corners, and Richard T. Brandt, New Berlin, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,910
Int. Cl.³ G21K *3/00*
U.S. Cl. 378—5 **11 Claims**



1. A device for filtering X-ray beam pulses at high and low energy levels projected alternately from an X-ray source toward a location for being occupied by a body, said device comprising:

an axially extending hollow mounting member supported for rotation,

first and seconds part of elements having different filtration properties mounted on said member at opposite sides, respectively, of its axis of rotation such that the X-ray beam will pass through both elements in a pair simultaneously when the elements are rotated across the X-ray beam,

ac motor means for being energized at power line frequency and for running continuously concurrently with X-ray beam pulsing,

a rotatable member for being driven rotationally by the motor means about an axis coinciding with the axis of said mounting member,

coupling means interposed between said motor driven rotatable member and said mounting member, said coupling means being adjustable rotationally about said coinciding axes to a selected angular position for establishing the desired angular relationship of the elements with respect to the motor driven rotatable member, and

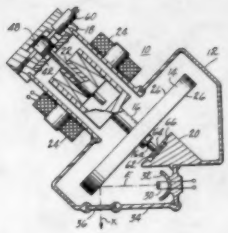
means for controlling said X-ray source to project an X-ray beam pulse coordinately with said elements being rotated into the X-ray beam path.

4,399,551

X-RAY TUBE HAVING ROTATABLE TRANSVERSELY OSCILLATORY ANODE

John K. Grady, 111 Flough Rd., Harvard, Mass. 01451

Filed Sep. 29, 1980, Ser. No. 191,936
Int. Cl.³ H01J *35/10*
U.S. Cl. 378—126 **7 Claims**



1. An X-ray tube comprising:

a chamber enclosing an electron beam source including a cathode for projecting electrons along a beam axis and a window in said envelope through which X-rays may emerge;

an anode-disc rotatable about a shaft, said disc having a planar surface normal to said axis of rotation, said beam source being disposed so as to direct said electron beam at an angle of incidence to said normal surface to produce an X-ray which is transmitted through said window; and

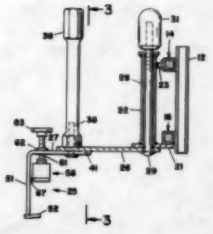
means to impart transverse movement to said disc during rotation thereof including support means engaging respective ends of the shaft, guide means slidingly receiving at least one support means and holding the shaft at a fixed angle to the electron beam axis, and means imparting translatory movement to the shaft, thereby to minimize the quantity of electron beams striking any given path on said disc in any particular time interval.

4,399,552

CROSSTABLE X-RAY CASSETTE HOLDER

Governor K. Renshaw, 14448 Merced St., San Leandro, Calif. 94579

Continuation-in-part of Ser. No. 166,609, Jul. 7, 1980, Pat. No. 4,333,014. This application Feb. 12, 1982, Ser. No. 348,600
Int. Cl.³ G01N *21/01*; G11B *1/00*; G12B *9/00*
U.S. Cl. 378—167 **9 Claims**



1. An adjustable cross table film holder having film clamping means carried by a pivot plate pivotally engaging a link pivotally mounted on a mounting unit in adjustable pivotal relation thereto and said mounting unit having a leg depending from one side of a top mounting plate with a narrow bottom plate extending from the bottom of said leg beneath said top plate and a clamping plate disposed adjacent said leg above said bottom plate and movably mounted with respect to said top

and bottom plates for clamping an X-ray table edge between clamping plate and bottom plate.

4,399,553

CHARACTER READER

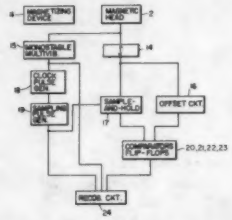
Akira Toyama, Shimosuwa, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Dec. 29, 1980, Ser. No. 221,107

Claims priority, application Japan, Dec. 29, 1979, 54-181958[U]; Jan. 21, 1980, 55-5444

Int. Cl.³ G06K *9/18*

U.S. Cl. 382—7 **18 Claims**



1. A character reader for reading a character pattern printed on a supporting means, said reader including reading means for generating an output signal in response to said character pattern and means for transporting said supporting means past said reading means, said character reader further comprising:

integrating means for receiving and integrating said output signal to provide an integrated signal;

sampling means for sampling said integrated signal at a plurality of successive sampling times separated by sampling intervals to produce a plurality of signal samples;

means for deriving a comparison signal from said integrated signal during each sampling interval;

comparison means for comparing said comparison signal derived from said integrated signal during each sampling interval with one of said signal samples taken at a sampling time prior to said each sampling interval; and

recognition means for recognizing said character pattern in accordance with the output of said comparison means.

4,399,554

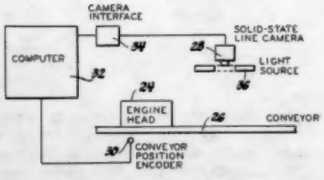
METHOD AND APPARATUS FOR INSPECTING ENGINE HEAD VALVE RETAINER ASSEMBLIES FOR MISSING KEYS

Walton A. Perkins, III, Troy; Lothar Rossol, Rochester; Robert Dewar, Troy, and James K. West, Auburn Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1980, Ser. No. 180,131

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—8 **6 Claims**



4. A machine implemented method of processing a digitized image of a valve spring assembly of an engine head, the image being represented by a two dimensional array of pixel light intensity values; the method comprising the steps of:

(a) constructing an edge pixel array of binary values from said array of pixel light intensity values,

(b) identifying the center of symmetry of the array of edge pixels; and

(c) determining the percent of those pixels located at a predetermined radius from the center of symmetry of the edge pixel array which have a light intensity value which is greater than a predetermined threshold to determine whether both keys of the valve spring assembly are present.

4,399,555

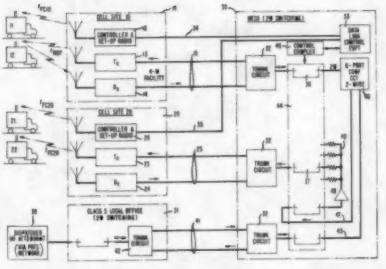
CELLULAR HIGH CAPACITY MOBILE RADIOTELEPHONE SYSTEM WITH FLEET-CALLING ARRANGEMENT FOR DISPATCH SERVICE

Verne H. MacDonald, Elberon; Philip T. Porter, Colts Neck, and W. Rae Young, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1980, Ser. No. 144,609

Int. Cl.³ H04B *7/00*; H04M *7/00*; H04Q *7/04*

U.S. Cl. 455—33 **11 Claims**



1. In a cellular mobile radiotelephone communication system having a control office (30) for switchably interconnecting information messages through input/output connections of said control office to and from users of mobile units in different service regions of the system, the system being characterized in that there are provided in the control office

a fan-out circuit (48, 49) having an input connection and plural output connections, one such output connection for each of a predetermined plurality of cells of said system,

means (43, 46, 47) for coupling the fan-out circuit input connection to receive information message signals from a first input/output connection of the control office,

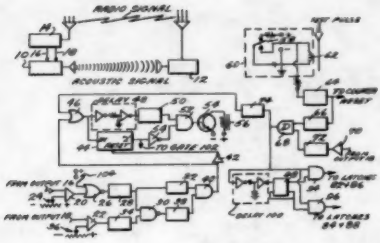
means (32) for coupling the fan-out circuit output connections to apply information message signals to respective connections for providing control office outputs, and

means (32), including at least a part (46) of the fan-out circuit input coupling means, for bidirectionally coupling information message signals through at least one additional input/output connection of said control office with said first input/output connection, said bidirectional coupling means including means for also coupling bidirectional coupling means information message signals, being coupled in either direction through said bidirectional coupling means, from said bidirectional coupling means to said fan-out circuit input connection.

4,399,556
DEVICE FOR LOCATING AUDIO SURVEILLANCE APPARATUS

Glenn H. Whidden, 13214 L'Enfant Dr., Fort Washington, Md. 20744

Filed Mar. 12, 1982, Ser. No. 357,614
Int. Cl.³ H04B 17/00, 11/00
U.S. Cl. 455—67 13 Claims



1. A device for use in conjunction with a detector of covert audio surveillance apparatus of the type which senses information in the audio frequency range and which includes a transmitter for generating electromagnetic signals comprising a carrier frequency modulated by said information, said detector demodulating the electromagnetic signals to develop separate output signals representative of the carrier frequency and said modulating information, said device including:

means for producing discrete acoustic pulses and for propagating said pulses towards said transmitter portion;

means responsive to an input signal for initiating a first timing interval of predetermined duration;

means joined to said detector and to said timing interval initiating means for actuating said acoustic pulse producing means at the termination of said interval to produce and propagate a first acoustic pulse, said means preventing the actuation of the acoustic pulse producing means when an output signal representative of modulating information occurs during said interval;

means responsive to the actuation of said pulse producing means to initiate a second timing interval of predetermined duration;

means joined to said second timing interval initiating means and responsive to an output signal developed by the detector in response to receipt of modulating information during said second timing interval for actuating said acoustic pulse producing means to produce and propagate a second acoustic pulse;

a first means for measuring the time interval occurring between the actuation of said pulse producing means which produces and propagates said first acoustic pulse and the development of an output signal by the detector in response to receipt of modulating information during the second time interval initiated by such actuation;

a second means for measuring the time interval occurring between the actuation of said pulse producing means which produces and propagates said second acoustic pulse and the development of an output signal by the detector in response to receipt of modulating information during the second timing interval initiated by such further actuation;

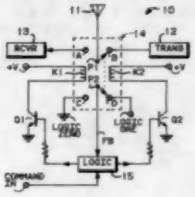
means for comparing the time intervals measured by said first and second measuring means; and

means joined to said comparing means for providing an alarm when the measured time intervals are equal.

4,399,557
MINIMUM POWER, FEEDBACK CONTROLLER, TRANSMIT/RECEIVE SWITCH

Robert P. Muszkiewicz, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 15, 1981, Ser. No. 330,979
Int. Cl.³ H04B 1/44
U.S. Cl. 455—82 12 Claims



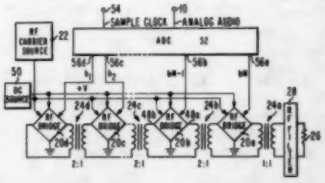
1. In a transceiver comprising an antenna and transmitting and receiving devices alternatively sharing use of said antenna by switching means controllable to selectively couple a selected one of said transmitting and receiving devices to said antenna in response to a selected transmit/receive control signal from a control signal source, the improvement for minimizing power consumption by said switching means and for assuring that the selected device is coupled to said antenna in response to said control signal comprising:

logic means coupled to the source of said transmit/receive control signal and to said switching means for comparing the status of said switching means with said control signal and actively energizing said switching means only when its status disagrees with the status commanded by said transmit/receive control signal.

4,399,558
CASCADED DIGITAL BROADCAST TRANSMITTER

Charles F. Smollin, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,454
Int. Cl.³ H03C 1/04
U.S. Cl. 455—108 6 Claims



1. An apparatus for generating an amplitude modulated signal from a weighted digital signal, said apparatus comprising generating means for generating a plurality of equal amplitude signals in accordance with said digital signal, and combining means for combining at least some of said plurality of signals to form said amplitude modulated signal, said combining means comprising a plurality of cascade coupled transformers having the primary of one transformer coupled to the secondary of another transformer, at least some of said transformers having a turns ratio in accordance with said weighting of said digital signal.

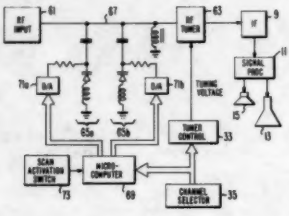
4,399,559
VOLTAGE CONTROLLED TUNER WITH VOLTAGE VARIABLE FREQUENCY SELECTIVE ARRANGEMENTS CONTROLLED IN RESPONSE TO A CONTROL VOLTAGE GENERATED INDEPENDENTLY OF THE TUNING VOLTAGE

Gerald E. Theriault, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 154,834, May 30, 1980, Pat. No. 4,361,909. This application Oct. 8, 1981, Ser. No. 309,696

Int. Cl.³ H04B 1/16

U.S. Cl. 455—179 **3 Claims**



1. In a receiver, apparatus for selecting various channels comprising:

RF input means for supplying RF signals;

tuning control means for generating a tuning control voltage in response to the selection of said channels;

RF frequency selective means for selectively applying RF carriers received from said RF input means having frequencies corresponding to respective channels to a mixer means in response to respective magnitudes of said tuning control voltage;

local oscillator means for generating a local oscillator signal having frequencies corresponding to respective channels in reponse to respective magnitudes of said tuning control voltage;

said mixer means being for combining a selected one of said RF carriers and said local oscillator signal to produce an IF signal having at least one information bearing carrier at a predetermined frequency;

IF processing means for deriving an information signal from said information bearing carrier;

further control means for generating a further control voltage independently of said tuning control voltage but also in response to the selection of said channels; and

further frequency selective means coupled to said RF frequency selective means for controlling the frequency response of said RF frequency selective means in response to the magnitude of said further control voltage.

4,399,560
DOUBLE PHASE LOCK LOOP ARRANGEMENT

Stephen W. Watkinson, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

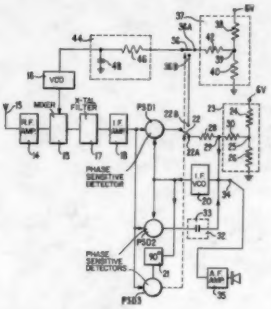
Filed Jun. 22, 1981, Ser. No. 276,093

Claims priority, application United Kingdom, Jul. 2, 1980, 8021658

Int. Cl.³ H04B 1/16; H03L 7/06

U.S. Cl. 455—260 **9 Claims**

4. A radio receiving apparatus including an RF amplifier, a mixer having inputs coupled to an output of the RF amplifier and a voltage controlled local oscillator and a first phase sensitive detector which are included in a first feedback loop, an IF filter coupled to an output of the mixer, a second feedback loop including an IF voltage controlled oscillator for providing a reference signal, said first phase sensitive detector and second and third phase sensitive detectors, each detector having first and second inputs and an output, each first input being coupled to an output of the IF filter, the IF voltage controlled oscillator being connected to the second inputs of the first and second phase sensitive detectors and via phase shifting means to the second input of the third phase sensitive detector on whose output a lock signal is produced in response to the signals on its first and second inputs being in a desired phase relationship, the output of said second phase sensitive detector being coupled to said IF voltage controlled oscillator, the output of the first phase sensitive detector comprising a correction signal, and



switching means coupling, in response to absence of the lock signal, the output of said first phase sensitive detector to the IF voltage controlled oscillator for adjusting the output frequency thereof and for coupling, in response to the presence of the lock signal, the output of said first phase sensitive detector to the voltage controlled local oscillator for adjusting the frequency thereof.

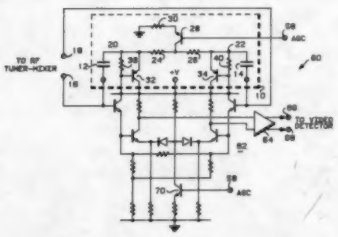
4,399,561
VARIABLE CAPACITANCE CIRCUIT

Gerald K. Lunn, Scottsdale, and Michael McGinn, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,609

Int. Cl.³ H04B 1/16

U.S. Cl. 455—266 **10 Claims**



1. Circuit for providing a variable and controlled capacitive impedance across a pair of input terminals thereof, comprising:

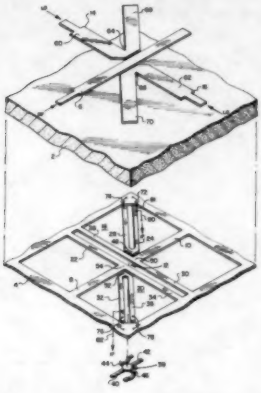
first and second capacitive means each having a first end coupled to a respective one of the pair of input terminals of the circuit and a second end; and

variable impedance means connected in series between said second ends of said first and second capacitive means, said variable impedance means receiving a control signal such that the impedance thereof is varied in response to said control signal wherein the impedance of the conductive path between said first and second capacitive means is varied which causes the total capacitive impedance developed across the pair of input terminals to be varied.

4,399,562
FULL BALUN MIXER

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 24, 1981, Ser. No. 286,406
Int. Cl.³ H04B 1/26; H01P 5/10
U.S. Cl. 455—327 16 Claims



12. Balun coupled microwave mixer circuit layout and structure comprising:

a dielectric substrate;

ground plane means on the bottomside of said substrate;

a first primary conductor on the topside of said substrate;

first and second secondary conductors on the bottomside of said substrate extending from said ground plane means towards each other to a separation gap therebetween and juxtaposed below said first primary conductor for interacting therewith to balun couple a field balanced between said first and second secondary conductors across said gap;

a second primary conductor on the topside of said substrate;

secondary conductor means on the bottomside of said substrate juxtaposed below said second primary conductor to interact therewith for balun field coupling; and

a diode pair mixer having only two diodes on the bottomside of said substrate isolated from said first and second primary conductors and interconnecting said first and second secondary conductors and said secondary conductor means for heterodyne modulation product signal generation one end of each diode of said diode pair being connected commonly to said secondary conductor means.

4,399,563
FIBER OPTICS HIGH SPEED MODEM

Joseph H. Greenberg, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation of Ser. No. 897,458, Apr. 18, 1978, abandoned.
This application Dec. 29, 1980, Ser. No. 220,868
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 13 Claims

1. Apparatus for transmitting and receiving data, comprising:

a. master means for generating a master timing signal timing at known intervals;

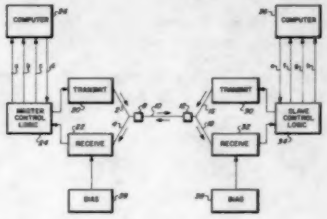
b. first means connected to said master means for responding thereto by sending encoded data when said master timing signal is received;

c. a second means for decoding received data;

d. an optical fiber having a first end and a second end opposite to said first end thereof for transferring received data at said first end to said second end and at said second end to said first end;

e. a third means for coupling said first end to said first and second means;

f. a fourth means for decoding received data;



g. a slave means responding to said fourth means decoding received data by generating a slave signal;

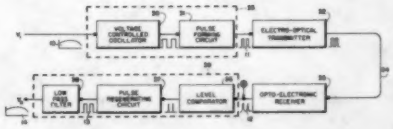
h. a fifth means connected to said slave means for transmitting encoded data when said slave signal is received; and

i. a sixth means for coupling said second end to said fourth and fifth means.

4,399,564
FIBER OPTIC SYSTEM FOR TRANSMISSION OF VIDEO SIGNALS BY PULSE-FREQUENCY-MODULATION

Steven J. Cowen, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 19, 1980, Ser. No. 122,335
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 15 Claims



1. A wideband fiber optic system for optically transmitting a video analog signal over a long distance, comprising:

waveform generating means responsive to an input video analog signal having a given amplitude and a given frequency spectrum for producing a stream of narrow, separated electrical pulses of constant width wherein the pulse stream has a variable repetition frequency and the repetition frequency is varied according to the amplitude of said analog signal;

wideband photoemitting transmitting means coupled to said waveform generating means for converting said electrical pulses into narrow optical pulses and transmitting said optical pulses;

an optical fiber cable coupled to said transmitting means for conducting said optical pulses;

wideband receiving means coupled to said optical fiber cable for receiving said optical pulses and converting said optical pulses into detected electrical pulses; and

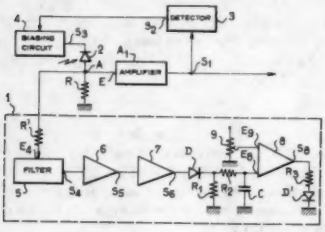
discriminating means coupled to said wideband receiving means and responsive to said detected electrical pulses for generating an output video analog signal having a given amplitude and a given frequency spectrum, the amplitude of said output analog signal varying according to the repetition frequency of said detected electrical pulses, whereby said output analog signal corresponds to said input analog signal.

4,399,565

DEVICE FOR TRIGGERING AN ALARM SYSTEM IN THE EVENT OF INSUFFICIENCY OF THE TRANSMISSION LEVEL, FOR THE RECEIVER MODULE OF AN OPTICAL-FIBER TRANSMISSION SYSTEM

Bertrand Jarret, and Rose Cordier, both of Paris, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste. Honorine, France

Filed Feb. 9, 1981, Ser. No. 232,966
Claims priority, application France, Feb. 12, 1980, 80 03047
Int. Cl.³ H04B 9/00
U.S. Cl. 455—612 7 Claims



1. A device for triggering an alarm system in the event of insufficiency of the transmission level for the receiver of a transmission system which utilizes an optical fiber, comprising:

a photodetector having an automatic gain regulation and producing noise in the event of said insufficiency of transmission level;

a filter connected to said photodetector for passing said noise, said filter having a passband which is external to the frequency band employed for optical fiber transmission;

means for amplifying said noise present at the output of said filter;

means for rectifying said noise present at the output of said amplifying means;

a circuit for comparing the amplitude of said noise to a threshold amplitude value, said comparing circuit being connected to the output of said rectifying means; and

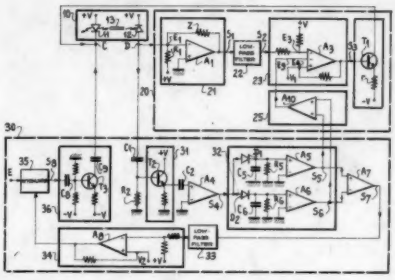
alarm-triggering means connected to the output of said comparing circuit for producing an alarm signal when said noise amplitude is greater than said threshold value.

4,399,566

DEVICE FOR STABILIZING THE OUTPUT POWER OF A TRANSMITTER MODULE IN AN OPTICAL FIBER TRANSMISSION SYSTEM

Gerald Roullet; Jean-Paul Breton, and Adalbert Maciaszek, all of Paris, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Nov. 12, 1981, Ser. No. 320,229
Claims priority, application France, Nov. 14, 1980, 80 24230
Int. Cl.³ H04B 9/00
U.S. Cl. 455—613 6 Claims



1. A device for stabilizing the output power of a transmitter module in a data transmission system which utilizes an optical fiber and comprising:

a unit in which are disposed a laser diode, means for taking a part of the optical output power produced by the laser diode and for converting optical power to electrical power;

a first circuit for stabilizing the mean value of the optical output power produced by said laser diode, said circuit being connected between said conversion means and said laser diode and provided with first voltage comparator means adapted to produce a laser-diode d.c. bias voltage corresponding to the mean value of the optical output power produced by said laser diode;

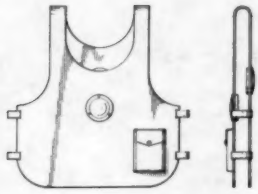
a second circuit for stabilizing the amplitude of modulation of the optical output power produced by said laser diode, said circuit being connected between said conversion means and said laser diode and provided with means for detecting the peak-to-peak amplitude of the laser-diode modulating signal and means for differentiating the signals generated by said peak-to-peak detection means so as to deliver a laser-diode modulating signal having a stabilized peak-to-peak amplitude corresponding to the difference between the maximum optical output power and the minimum optical utput power produced by the laser diode,

wherein said first circuit for stabilizing the mean value of the optical output power produced by the laser diode is further provided with means for restituting the low-frequency component of the signal to be transmitted, said restituting means being connected between the output of said peak-to-peak detection means and the input of said first voltage comparator means, thus permitting stabilization of the minimum and maximum values of optical output power produced by said laser diode.

DESIGNS

AUGUST 16, 1983

270,109
SAFETY JACKET
Peter E. Bluemel, Cranbourne, Australia, assignor to Jack Light Industrial Company Limited, Hong Kong, Hong Kong
Filed Jul. 9, 1981, Ser. No. 281,899
Claims priority, application United Kingdom, Jan. 15, 1981, 998458
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

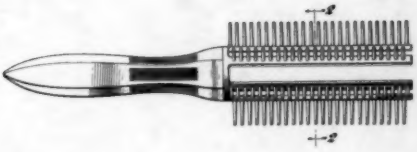


270,110
FACE MASK
Adrienne Moore, and A. Martin Zweiback, both of Los Angeles, Calif.
Continuation-in-part of Ser. No. 38,236, May 11, 1979, Pat. No. Des. 258,845. This application Feb. 23, 1981, Ser. No. 236,688
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—234

270,111
GYM SHOE
Ben R. Migdow, 945 Timberhill Rd., Highland Park, Ill. 60035
Filed Jun. 19, 1981, Ser. No. 275,505
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

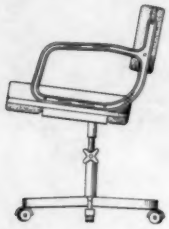
270,112
LUGGAGE
Ted Stark, Montclair, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,286
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—77

270,113
BRUSH
Anthony Battaglia, 386 NE. 191 St., North Miami Beach, Fla. 33178
Filed Nov. 7, 1980, Ser. No. 205,020
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

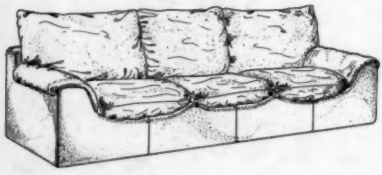


270,114
TABLE OR SIMILAR ARTICLE
Gabriella Crespi, Via Montenapoleone, 2, Milan, Italy
Filed Feb. 27, 1981, Ser. No. 239,040
Claims priority, application Italy, Sep. 8, 1980, 22714[U]
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

270,115
ARMCHAIR
Natan L. Iurcovich, Avda. del Tejar 2570, 1428 Buenos Aires, Argentina
Filed Jun. 5, 1980, Ser. No. 156,875
Claims priority, application Argentina, Dec. 10, 1979, 38,936
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

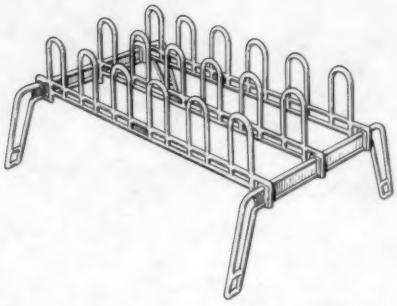


270,116
SOFA
Merle C. Meichior, Venice, Calif., assignor to Pacific Furniture Manufacturing Co., Compton, Calif.
Filed Aug. 28, 1981, Ser. No. 297,433
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

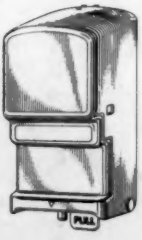


270,117
CHAIR
Natan L. Iurcovich, Avda. del Tejar 2570, 1428 Buenos Aires, Argentina
Filed Jun. 5, 1980, Ser. No. 156,876
Claims priority, application Argentina, Dec. 10, 1979, 38,937
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

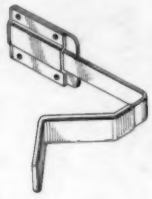
270,118
SHOE RACK
Reginald Wood, Gardner, Mass., assignor to Tamor Plastics Corporation, Leominster, Mass.
Filed Jul. 9, 1982, Ser. No. 396,775
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—85



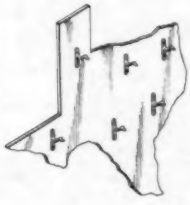
270,119
DISPENSER
William C. Rhodenbaugh, c/o Kutol Products Co., 2700 Highland Ave., Cincinnati, Ohio 45212
Filed Mar. 16, 1981, Ser. No. 244,023
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



270,120
MUSICAL INSTRUMENT SUPPORT BRACKET
Mathew McPherson, Sr., 5817 Olinger Rd., Edina, Minn. 55436
Filed Jun. 13, 1980, Ser. No. 159,288
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—114

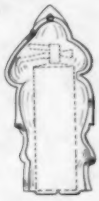


270,121
WALL RACK
John F. Brown, 9219 Alta Oaks Dr., Dallas, Tex. 75243
Filed Apr. 23, 1981, Ser. No. 256,965
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—114



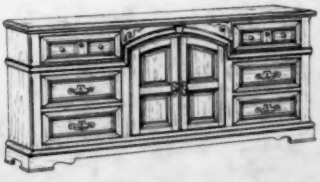
270,122
WALL MOUNTED PLANTER
Ben Stein, c/o 4900 Cote St. Luc Rd., Apt. 1102, Montreal, Quebec, Canada
Filed Feb. 20, 1981, Ser. No. 236,446
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—137

270,123
FIRE EXTINGUISHER COVER
Roberta N. Bingaman, Box 134, Hillsboro, Ind. 47949
Filed Feb. 17, 1981, Ser. No. 234,678
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D6—152

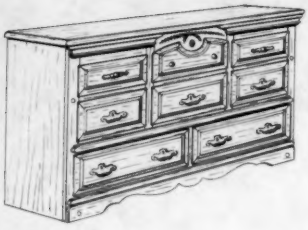


270,124
DRESSER OR THE LIKE
Harold V. Aulbert, 310 Prestwick, High Point, N.C. 27260, and Charles M. Horton, P.O. Box 263, Troutman, N.C. 28166
Filed Mar. 10, 1981, Ser. No. 242,318
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

270,125
DRESSER OR THE LIKE
Harold V. Aulbert, 310 Prestwick, High Point, N.C. 27260, and Charles M. Horton, P.O. Box 263, Troutman, N.C. 28166
Filed Mar. 23, 1981, Ser. No. 246,141
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

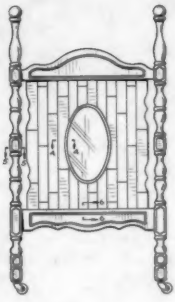


270,126
DRESSER OR THE LIKE
Harold V. Aulbert, 310 Prestwick, Hight Point, N.C. 27260, and Charles M. Horton, P.O. Box 263, Troutman, N.C. 28166
Filed Mar. 23, 1981, Ser. No. 246,142
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154



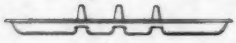
270,127
DRESSER OR THE LIKE
Harold V. Aulbert, 310 Prestwick, High Point, N.C. 27260, and Charles M. Horton, P.O. Box 263, Troutman, N.C. 28166
Filed Mar. 10, 1981, Ser. No. 242,276
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—164

270,128
CRIB FOOTBOARD
Harvey J. Draheim, Weyauwega, Wis., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Mar. 23, 1981, Ser. No. 246,356
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

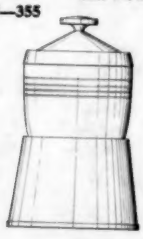


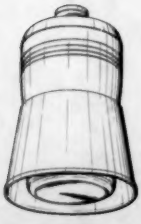
270,129
HANGER
Janusz Morawski, P.O. Box 562, Station P, Toronto, Ontario, Canada
Filed Aug. 18, 1980, Ser. No. 179,217
Term of patent 14 years
Int. Cl. D6—*08*; D9—*99*
U.S. Cl. D6—247

270,130
TACO SERVING TRAY
E. Stuart Fox, 1730 Pendrell St., #102, Vancouver, B.C. V6G 3A3, Canada
Filed Oct. 2, 1981, Ser. No. 307,799
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



270,131
EGG COOKER
Kok K. Hor, 10, Jalan Tempinis 3, Lucky Garden, Bangsar, Kuala Lumpur, Malaysia
Filed May 27, 1981, Ser. No. 267,633
Claims priority, application United Kingdom, Feb. 13, 1981, 998907
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—355

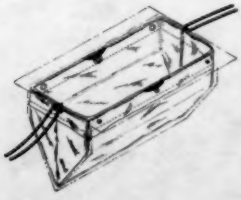




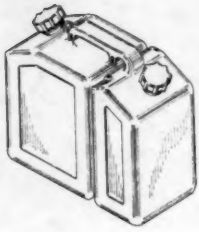
270,132
COMBINED ROW MARKER AND STRING CLEAT
Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325
Filed Jun. 15, 1981, Ser. No. 273,984
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D8—1

270,133
HOLD DOWN DEVICE FOR A BEACH BLANKET OR SIMILAR ARTICLE
Bradley M. Craig, 321 Lake Dr., Waldorf, Md. 20601
Filed Aug. 7, 1981, Ser. No. 290,872
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—388

270,134
DISPOSABLE PLASTIC BAG
Neville Stoute, 330 W. 58th St., New York, N.Y. 10019, and Robert J. Pennise, 2522 Lenhart Rd., Colmar, Pa. 18915, assignors to Neville Stoute; Robert J. Pennise; Richard M. Bird and James A. Falborn, all of New York, N.Y.
Filed Feb. 29, 1980, Ser. No. 126,146
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—305

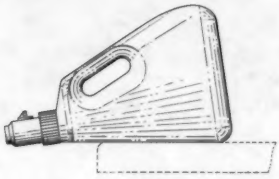


270,135
DUAL COMPARTMENT PORTABLE CONTAINER
Robert D. Gates, P.O. Box 65, Arena, Wis. 53506
Filed May 4, 1981, Ser. No. 260,032
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—341

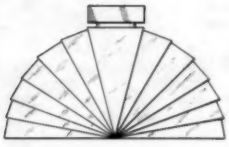


270,136
PLASTIC CONTAINER FOR LIQUIDS
John A. Cox, Bethel Park, Pa., assignor to Liqui-Box Corporation, Worthington, Ohio
Filed Aug. 4, 1981, Ser. No. 288,232
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—350

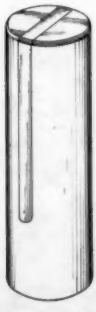
270,137
DISPENSING CONTAINER FOR LIQUIDS
John W. McDonald, Parkville, and John M. B. Ford, Lee's Summit, both of Mo., assignors to Realex Corporation, Kansas City, Mo.
Filed Mar. 19, 1981, Ser. No. 245,634
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376



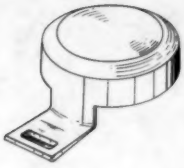
270,138
BOTTLE
Marc A. Rosen, New York, N.Y., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Jun. 11, 1981, Ser. No. 272,800
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—405



270,139
CONTAINER CLOSURE
Pierre Ballereaud, Dammarie, France, assignor to Produits de Beaute Lancaster, Monte Carlo, Monaco
Filed Feb. 18, 1981, Ser. No. 235,727
Claims priority, application France, Aug. 20, 1980, 802679
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—435

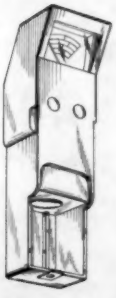


270,140
BOTTLE CAP
Jan Berglund, Västra Frölunda, Sweden, assignor to AB Wicanders Korkfabriker, Sweden
Filed Apr. 27, 1981, Ser. No. 257,934
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—438

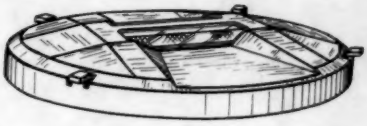


270,141
COMBINED DIGITAL WRIST WATCH AND THERMOMETER
Philip Y. Lam, 161 Kweilin St., Kowloon, Hong Kong
Filed Jul. 20, 1981, Ser. No. 284,620
Claims priority, application United Kingdom, Feb. 2, 1981, 998698
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—31

270,142
BATTERY TESTER
Frederick W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 13, 1981, Ser. No. 260,783
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77



270,143
SNOWPLOWABLE ROADWAY MARKER
Robert M. Flanagan, Lincolnshire, Ill., assignor to Amerace Corporation, New York, N.Y.
Filed Nov. 17, 1980, Ser. No. 207,380
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113

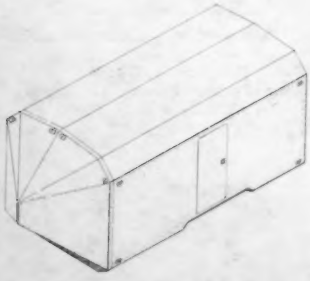


270,144
JEWELRY PENDANT
Marilyn M. Bruce, 1206 Dover Dr., Newport Beach, Calif. 92660
Filed Jun. 5, 1981, Ser. No. 270,907
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

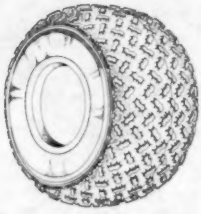
270,145
PENDANT
Marilyn M. Bruce, 1206 Dover Dr., Newport Beach, Calif. 92660
Filed Jun. 3, 1981, Ser. No. 270,906
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—82

270,146
SCULPTURE
Derek H. Roberts, Hawarden, Wales, assignor to Pendelfin Studios Limited, Lancashire, England
Filed Feb. 19, 1981, Ser. No. 235,778
Claims priority, application United Kingdom, Aug. 19, 1980, 80996198
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

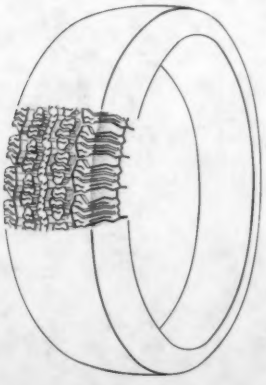
270,147
TRAILER ENCLOSURE
Frederick R. Faust, 305 Wood Rd., New Braunfels, Tex. 78130
Filed Feb. 13, 1981, Ser. No. 234,164
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102



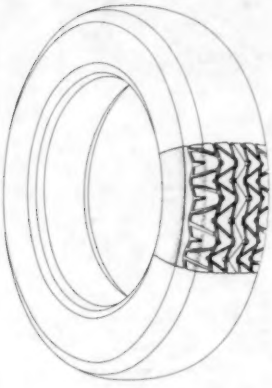
270,148
PNEUMATIC TIRE
Masami Shinomiya, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 12, 1981, Ser. No. 262,948
Claims priority, application Japan, Nov. 29, 1980, 55-50307
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136



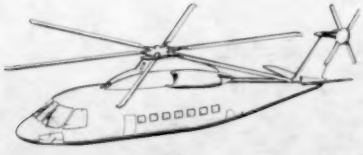
270,149
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerassimos C. Candiliotis, Grosse Pointe Farms, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Jan. 21, 1981, Ser. No. 226,666
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



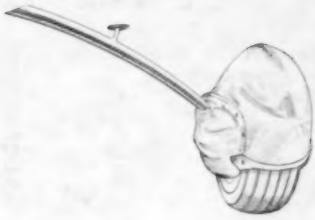
270,150
TIRE
Philippe Grenie, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Continuation of Ser. No. 218,688, Dec. 22, 1980, abandoned, and a continuation of Ser. No. 218,689, Dec. 22, 1980, abandoned.
This application Nov. 15, 1982, Ser. No. 441,404
Claims priority, application France, Jun. 26, 1980, 33
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



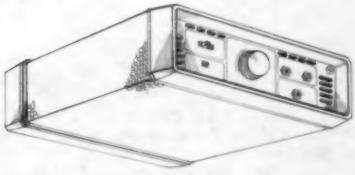
270,151
HELICOPTER
Andrew Whyte, Norwalk, Conn., assignor to United Technologies Corp., Hartford, Conn.
Filed Oct. 14, 1980, Ser. No. 196,507
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—327



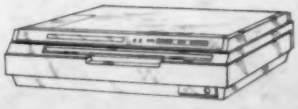
270,152
AIRPLANE MAIN LANDING GEAR-STRUT AND WHEEL PANTS COVER
William T. Dale, Arlington, Tex., assignor to Charles M. Seibel, Arlington, Tex.
Filed Apr. 23, 1980, Ser. No. 143,117
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—345



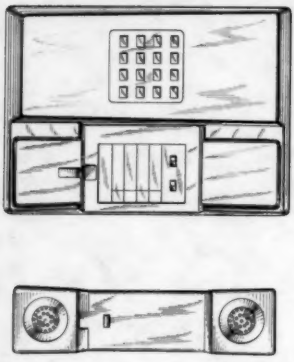
270,153
SPEAKER VOLUME CONTROL
Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01778
Filed Oct. 3, 1980, Ser. No. 193,604
Term of patent 14 years
Int. Cl. D14—*01*; D17—*99*
U.S. Cl. D14—1



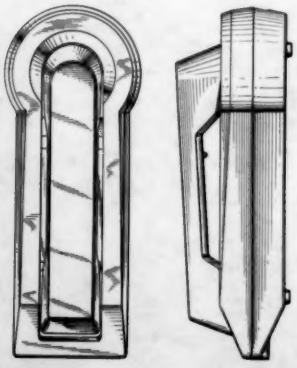
270,154
VIDEO DISK PLAYER
Mitsuru Ohnuma, Tokyo; Fumio Toyoda, Koganei, and Kazuyuki Tsuburaya, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 21, 1981, Ser. No. 256,098
Claims priority, application Japan, Dec. 26, 1980, 55-54139
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1



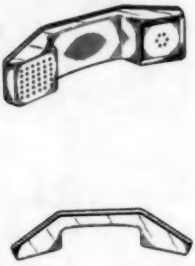
270,155
COMBINED TELEPHONE HOUSING AND HANDSET THEREFOR
Y. Shimizu, Ichihara, Japan, assignor to Arrow Trading Co., Inc., New York, N.Y.
Filed Sep. 7, 1982, Ser. No. 415,241
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



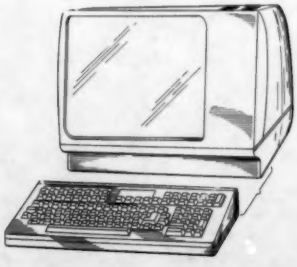
270,156
TELEPHONE
Y. Shimizu, Ichihara, Japan, assignor to Arrow Trading Co., Inc., New York, N.Y.
Filed Sep. 7, 1982, Ser. No. 415,578
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—56



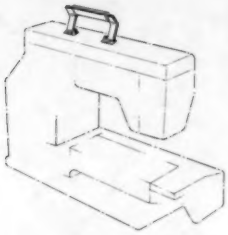
270,157
TELEPHONE HANDSET
Melvin H. Boldt, Glenview; David P. Chuboff, North Barrington; Wayne J. Franek, Palatine, and Marilyn M. Johnson, Northbrook, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Jun. 22, 1981, Ser. No. 276,542
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63



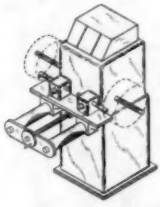
270,158
COMPUTER TERMINAL
Gregory Fossella, and J. B. MacDonald, both of Boston, Mass., assignors to Hazeltine Corporation, Greenlawn, N.Y.
Filed Nov. 4, 1980, Ser. No. 203,916
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



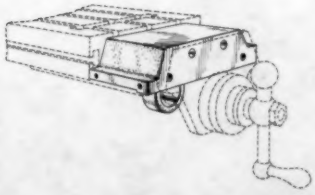
270,159
CARRYING HANDLE FOR SEWING MACHINE
Susumu Hanyu, Hachioji, and Kenzo Yuasa, Fuchu, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Feb. 23, 1981, Ser. No. 236,708
Term of patent 14 years
Int. Cl. D15—*06*; D08—*06*
U.S. Cl. D15—72



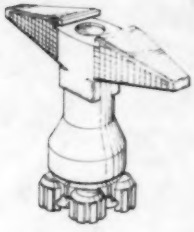
270,160
BRAKE LATHE
R. Warren Aldridge, Jr., 10022 Nadina Dr., Huntsville, Ala. 35803
Filed Jul. 23, 1981, Ser. No. 286,291
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—130



270,161
FEED EXTENSION FOR MILLING MACHINE
John Laux, 820 N. 57th, Lincoln, Nebr. 68505
Filed Jan. 8, 1981, Ser. No. 223,479
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—131

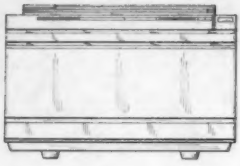


270,162
EXTRUSION MOULDING APPARATUS
Robert Kay, Poynton, England, assignor to Harbutt's Plasticine Limited, Bathampton, England
Filed Oct. 9, 1979, Ser. No. 83,006
Claims priority, application United Kingdom, Jun. 1, 1979, 79990146
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—135



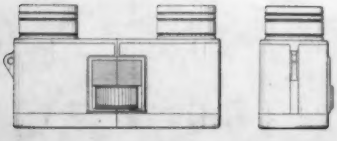
270,163
HAND HELD WRAPPING APPARATUS
Michael H. Shulman, 45 Bruce Farm Dr., Willowdale, Ontario, Canada
Filed Apr. 20, 1981, Ser. No. 255,356
Claims priority, application Canada, Jan. 8, 1981, 08-01-81-1
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145

270,164
ELECTROSTATIC COPYING MACHINE
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 18, 1981, Ser. No. 264,796
Claims priority, application Japan, Nov. 28, 1980, 55-50162
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

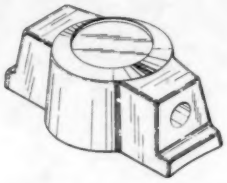


270,165
EYEGLASSES
Dennis L. Burns, Seattle, Wash., assignor to Pro-Tec, Inc., Bellevue, Wash.
Filed Feb. 25, 1981, Ser. No. 238,082
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—117

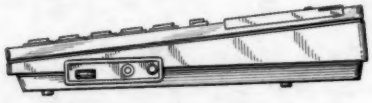
270,166
BINOCULARS
Masakazu Tomatsuri, Naka, and Hitoshi Suyama, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Jan. 30, 1981, Ser. No. 230,345
Claims priority, application Japan, Aug. 18, 1980, 55-33668
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—133



270,167
DRUM LUG
Fred A. Hoey, San Antonio, Tex., assignor to C. Bruno & Son, Inc., San Antonio, Tex.
Filed Apr. 22, 1981, Ser. No. 256,556
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

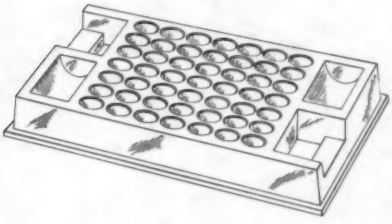


270,168
TYPEWRITER
Yoshio Ogawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 5, 1981, Ser. No. 270,838
Claims priority, application Japan, Dec. 9, 1980, 55-51356
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



270,169
FINGER-MOUNTED REMEDIAL READING AID
Daniel H. Greene, 15910 Ventura Blvd., Encino, Calif. 91324, and Lawrence J. Greene, 1031 Foster City Blvd., Foster City, Calif. 94404
Filed Jun. 12, 1980, Ser. No. 146,696
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

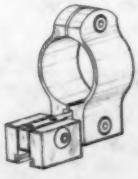
270,170
GAME BOARD
Philip L. Shoptaugh, 122 LaSalle Ave., Piedmont, Calif. 94610
Filed Aug. 18, 1981, Ser. No. 293,871
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



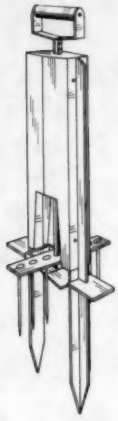
270,171
SET OF GAME PLAYING PIECES
Michael J. Janusz, 3049 N. Oak Park Ave., Chicago, Ill. 60634
Filed Jun. 9, 1980, Ser. No. 157,363
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—52

270,172
PUG NOSE TROLL
Mina F. Hassman, P.O. Box 2067, McKinleyville, Calif. 95521
Filed May 22, 1981, Ser. No. 266,327
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

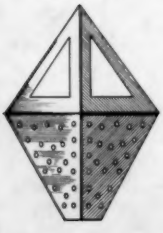
270,173
SCOPE MOUNT FOR A PISTOL
Daniel L. Bechtel, P.O. Box 11281, Forth Worth, Tex. 76109
Filed Mar. 4, 1981, Ser. No. 240,590
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



270,174
MOLE TRAP
Henry F. Gaines, 6430 E. Berwyn St., Indianapolis, Ind. 46203
Filed Jun. 1, 1981, Ser. No. 268,650
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



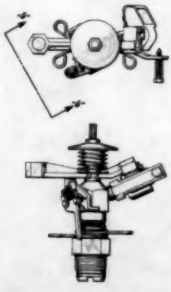
270,175
INSECT LURE
Daniel M. Stout, Kirkwood, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.
Filed Jun. 17, 1981, Ser. No. 274,548
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



270,176
ARTIFICIAL FISHING LURE
William O. Williams, Jr., Rte. 2, Box 172, Clover, S.C. 29710
Filed Dec. 14, 1979, Ser. No. 103,939
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

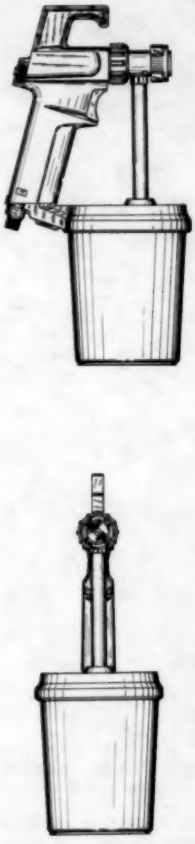
270,177
FISHING LURE
William D. Storm, and David A. Storm, both of P.O. Box 305, Norman, Okla. 73070
Filed Jul. 9, 1981, Ser. No. 281,683
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

270,178
IRRIGATION SPRINKLER
Michael E. Heck, Sacramento, Calif., assignor to Berkan-Heck Company, Sacramento, Calif.
Filed Dec. 11, 1980, Ser. No. 215,326
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

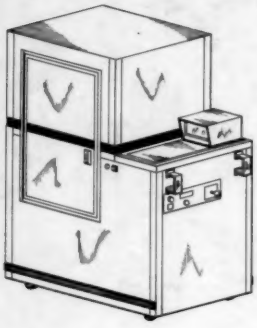


270,179
SPRAY GUN
Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Jun. 1, 1981, Ser. No. 269,277
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

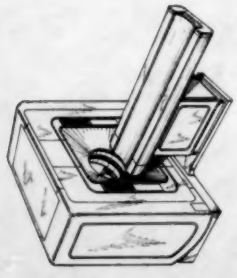
270,180
SPRAY GUN
Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Jun. 1, 1981, Ser. No. 269,276
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



270,181
X-RAY INSPECTION CABINET
David J. Haas, Suffern, N.Y., assignor to North American Philips Corporation, New York, N.Y.
Filed Oct. 27, 1980, Ser. No. 200,803
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—02



270,182
GANTRY WITH PATIENT TABLE FOR COMPUTERIZED TOMOGRAPHY SCANNER SYSTEM
Kenneth Wagner, Chesterland, Ohio, assignor to Technicare Corporation, Solon, Ohio
Filed Sep. 17, 1982, Ser. No. 418,625
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—02

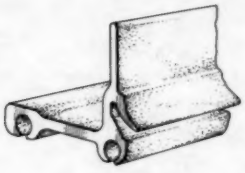


270,183
SUCTION HEAD FOR DENTAL USE
Rainer Govenius, Nastola, Finland, assignor to Mediman Ky, Finland
Filed Jan. 26, 1981, Ser. No. 228,451
Claims priority, application Finland, Aug. 21, 1980, 596/80; Oct. 23, 1980, 777/80
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

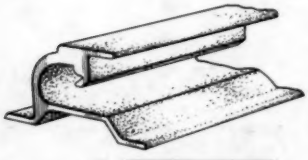
270,184
BASE FOR A FALSE TOOTH
Ehrenfried G. B. Wolf, Rte. 1, Box 143 A, Raymond, Wash. 98577
Filed Jun. 9, 1980, Ser. No. 139,786
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

270,185
WEATHERSEAL MOLDING
Ronald E. Wooten, 25218 Maynard Dr., Sunnymead, Calif. 92388, and Gerald A. Kwan, 3537 Mountain View, Pasadena, Calif. 91107
Filed Aug. 28, 1981, Ser. No. 297,141
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

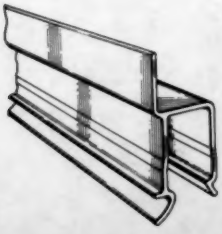
270,186
METAL SECTION
Richard E. Jones, Carlingford, Australia, assignor to Byrne & Davidson Doors (NSW) Pty. Limited, Revesby, Australia
Filed Sep. 2, 1981, Ser. No. 298,660
Claims priority, application Australia, Mar. 12, 1981, 83-565
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



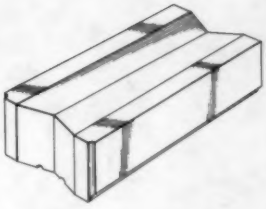
270,187
CHANNEL GUIDE SECTION FOR WINDLOCKED ROLLING DOOR
Martin H. Whitehouse, Northmead, Australia, and Robert L. Combs, Huntington Beach, Calif., assignors to Byrne & Davidson Doors (NSW) Pty. Limited, Revesby, Australia
Filed Sep. 10, 1981, Ser. No. 301,572
Claims priority, application Australia, Mar. 12, 1981, 83,564
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



270,188
GUIDE SECTION
Martin H. Whitehouse, Northmead, Australia, assignor to Byrne & Davidson Doors (NSW) Pty. Ltd., Revesby, Australia
Filed Sep. 2, 1981, Ser. No. 298,732
Claims priority, application Australia, Mar. 4, 1981, 83,483
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

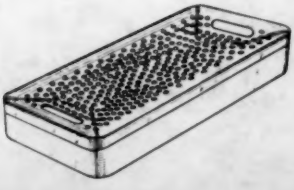


270,189
BRICK
Tian Khoo, 286 Jalan Pasar, Kapar, Klang, Selangor, Malaysia
Filed Mar. 23, 1981, Ser. No. 246,155
Claims priority, application United Kingdom, Sep. 23, 1980, 996679
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

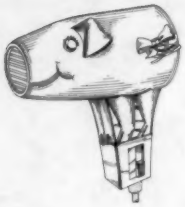


270,190
FOG LIGHT
Matsuo Ichikawa, Takasaki, Japan, assignor to Ichikawa Press Industry Co., Ltd., Takasaki, Japan
Filed Dec. 19, 1980, Ser. No. 218,378
Claims priority, application Japan, Aug. 25, 1980, 55-34744
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28

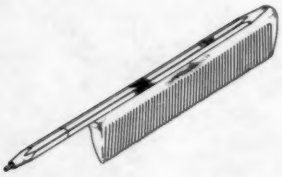
270,191
ASHTRAY
Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini, 13, 20149 Milano, Italy
Filed Jul. 31, 1981, Ser. No. 288,893
Claims priority, application Italy, Feb. 24, 1981, 20884/81[U]
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—29



270,192
BLOW DRYER
Frank Antonsecci, 276 Indian Trail, Mountainside, N.J. 07092, and Ronald Cariuccio, 242 Washington St., Berkeley Heights, N.J. 07922
Filed Oct. 5, 1981, Ser. No. 308,833
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

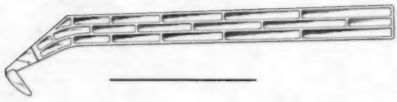


270,193
COMBINED COMB AND PEN
Derren A. Klein, 698 E. 650 North, Centerville, Utah 84014
Filed Oct. 19, 1981, Ser. No. 312,645
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25



270,194
HAIR COMB
Duane A. Logan, 730 N. Olive St., South Bend, Ind. 46628
Filed Jul. 10, 1981, Ser. No. 282,069
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—30

270,195
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 25, 1982, Ser. No. 352,149
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



270,196
RAZOR HANDLE
Michael J. Gray, Duxbury, and Robert A. Trotta, Pembroke, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 25, 1982, Ser. No. 352,147
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

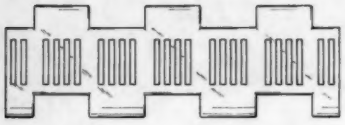
270,197
RAZOR HANDLE
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 19, 1982, Ser. No. 359,876
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

270,198
PEDICURE IMPLEMENT
Francis W. Child, 1307 Southfork Rd., Cody, Wyo. 82414
Filed Apr. 1, 1981, Ser. No. 243,891
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—59

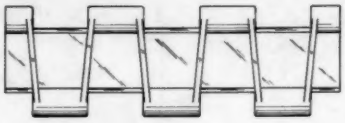
270,199
ILLUMINATED COMPACT
Yuen Se-Kit, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Hong Kong, Hong Kong
Filed Dec. 29, 1980, Ser. No. 220,284
Claims priority, application United Kingdom, Jul. 1, 1980, 995519
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D28—78

270,200
WASTE RECEPTACLE
E. J. Creske, Wausau Tile, P.O. Box 1520, Wausau, Wis. 54401
Filed Oct. 23, 1981, Ser. No. 314,405
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D34—7

270,201
CONVEYOR MODULE
William G. Hodlewsky, Greendale, Wis.; Jack E. Harris, Savannah, Ga., and Roger H. Schroeder, Hartland, Wis., assignors to Rexnord Inc., Milwaukee, Wis.
Filed Sep. 18, 1980, Ser. No. 188,192
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—29



270,202
CONVEYOR MODULE
William G. Hodlewsky, Greendale, Wis.; Jack E. Harris, Savannah, Ga., and Roger H. Schroeder, Hartland, Wis., assignors to Rexnord Inc., Milwaukee, Wis.
Filed Sep. 18, 1980, Ser. No. 188,194
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—29



270,203
KIOSK FOR AUTOMATIC BANKING OR THE LIKE
Randall L. Elliott, and James A. Pickel, both of Oklahoma City, Okla., assignors to Liberty National Bank & Trust Co., Oklahoma City, Okla.
Filed Aug. 28, 1981, Ser. No. 297,144
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—28

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Bok, Song H.; Jackson, LeRoy E.; Schroedel, Cynthia J.; and Seidman, Martin, 4,399,222, Cl. 435-234.000.
Flider, Frank J.; Orthoefer, Frank T.; and Short, Robert G., 4,399,224, Cl. 435-271.000.

A.P.V. Company Limited, The: *See*—
Bond, Michael P., 4,398,591, Cl. 165-78.000.

A.S.R. Servotron AG: *See*—
Petsch, Johann, 4,399,486, Cl. 361-386.000.

Abe, Masaharu: *See*—
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,398,987, Cl. 156-324.000.

Abe, Tadamichi: *See*—
Tosaka, Susumu; Abe, Tadamichi; Endo, Hozumi; and Ogawa, Kiyohiro, 4,399,113, Cl. 423-240.000.

Abts, Leigh R., to Micro Pure Systems, Inc. Ultrasonic sensing. 4,398,424, Cl. 73-632.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H., 4,398,557, Cl. 137-493.900.

Ackerman, Norman A., to Perma Power Electronics, Inc. Temporary mounting means for multiple outlet strip. 4,398,647, Cl. 220-3.900.

Acloque, Jean-Pierre: *See*—
Auger, Henri; and Acloque, Jean-Pierre, 4,398,802, Cl. 350-292.000.

Adachi, Hiromi: *See*—
Oshita, Hiroshi; Adachi, Hiromi; and Inoue, Kazunari, 4,399,390, Cl. 315-101.000.

Adaptive Optics Associates, Inc.: *See*—
Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, 4,399,356, Cl. 250-201.000.

Adkins, Charlotte G.: *See*—
Adkins, James K.; and Adkins, Charlotte G., 4,399,353, Cl. 235-78.00R.

Adkins, James K.; and Adkins, Charlotte G. Color computer wheel. 4,399,353, Cl. 235-78.00R.

Advanced Mechanical Technology, Inc.: *See*—
Cook, Nathan H.; and Carignan, Forest J., 4,398,429, Cl. 73-862.040.

Ael Microtel, Ltd.: *See*—
Froese, Abram; and Fikart, Josef L., 4,399,408, Cl. 324-78.00Z.
Thompson, David, 4,399,409, Cl. 324-78.00Z.

Aeroquip Corporation: *See*—
Perrine, Neill D., 4,398,553, Cl. 137-68.00R.

Aga Aktiebolag: *See*—
Peterson, Rune, 4,398,971, Cl. 148-16.000.

Agarwal, Dwarika P.; and Ingersoll, Clyde E., to Williams Gold Refining Company Incorporated. High temperature brazing alloys. 4,399,096, Cl. 420-463.000.

Agdern, Fredric A., to Mobil Oil Corporation. Subsea riser manifold with structural spanning member for supporting production riser. 4,398,846, Cl. 405-185.000.

Agence Nationale de Valorisation de la Recherche ANVAR: *See*—
Chabrerie, Jean-Pierre, 4,399,381, Cl. 310-178.000.
Godfroid, Jean-Jacques; and Thuillier, Jean, 4,399,299, Cl. 560-63.000.

Agency of Industrial Science & Technology: *See*—
Inao, Fumiya, 4,398,331, Cl. 29-157.00R.

Agfa-Gevaert AG: *See*—
Wagensonner, Eduard; Wagner, Karl; and von Fischern, Bernhard, 4,398,813, Cl. 354-23.00D.

AGFA-Gevaert Aktiengesellschaft: *See*—
Bauer, Walter, 4,399,363, Cl. 250-483.100.
Boie, Immo; Luhrig, Hermann; Kovacic, Guido; and Keller, Karlheinz, 4,399,212, Cl. 430-404.000.
Kluczynski, Achim; and Altmann, Erik, 4,398,679, Cl. 242-74.000.
Lohmer, Karl, 4,399,214, Cl. 430-532.000.

Agfa-Gevaert N.V.: *See*—
Muylle, Wilfried E.; and Buelens, Edward, 4,398,814, Cl. 354-275.000.

Ahrns, Daniel C.; and Rachedi, Shane H., to Ford Motor Company. Multi-stage exhaust gas recirculation system. 4,398,525, Cl. 123-568.000.

Aikins, Warren A.; and Melin, Thomas N. Tree processing apparatus. 4,398,581, Cl. 144-366.000.

Air Products and Chemicals, Inc.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,399,308, Cl. 564-479.000.

Air-Tech Industries, Inc.: *See*—
Fraioli, Donato M., 4,398,376, Cl. 52-2.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,398,419, Cl. 73-518.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Okuyama, Teiji, 4,398,764, Cl. 296-15.000.

Aito, Yuzo: *See*—
Sasaki, Hideharu; Nakamura, Tsutomu; Shimada, Keizo; Aito, Yuzo; and Tabe, Yutaka, 4,398,995, Cl. 162-157.300.

Aizawa, Shirou: *See*—
Suzuka, Teruo; Inoue, Yukio; Aizawa, Shirou; Ishibashi, Yasushi; and Ohse, Hidetaka, 4,399,023, Cl. 208-112.000.

Ajinomoto Company Incorporated: *See*—
Matsuishi, Tsutomu; Maruyama, Hiromasa; Kitahara, Toshio; Kabashima, Akemi; and Toyomasu, Ryuta, 4,399,304, Cl. 562-445.000.
Okada, Yuzo, 4,399,162, Cl. 426-548.000.

Akagi, Kazuo: *See*—
Tanaka, Yoshiro; Fujii, Noritsugu; Akagi, Kazuo; and Shitamatsu, Ryujiro, 4,398,552, Cl. 134-57.00R.

Akahori, Hiroyuki: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,398,753, Cl. 282-27.500.

Akao, Hideyuki: *See*—
Muguruma, Norio; Morihisa, Mitsuo; and Akao, Hideyuki, 4,399,524, Cl. 365-229.000.

Akiyama, Hiroyuki; Izawa, Susumu; Hirosawa, Kuninori; and Inada, Hideharu, to Japan Styrene Paper Corporation. Process for producing foamed polyolefin articles from aged pre-foamed particles of polyolefin resins. 4,399,087, Cl. 264-53.000.

Akzona Incorporated: *See*—
Newman, Thomas C., 4,398,918, Cl. 44-51.000.
Richmond, James M., 4,399,044, Cl. 252-8.800.
Zakaria, Moneeb, 4,398,919, Cl. 44-51.000.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Duncan, Jeffrey B., 4,398,996, Cl. 162-198.000.
Panto, Joseph S.; and Kaswell, Ernest R., 4,398,915, Cl. 8-543.000.

Albarella, James P.; Carrico, Robert J.; and Li, Thomas M., to Miles Laboratories, Inc. Iodothyronine immunogens and antibodies. 4,399,121, Cl. 260-112.50R.

Albizzati, Enrico: *See*—
Ferraris, Mario; Rosati, Francesco; Parodi, Sandro; Giannetti, Enzo; Motroni, Giuseppe; and Albizzati, Enrico, 4,399,054, Cl. 252-429.00B.

Alexoff, Carl: *See*—
Goldman, Max; and Alexoff, Carl, 4,398,708, Cl. 270-18.000.

Alfa Farmaceutici S.p.A.: *See*—
Cannata, Vincenzo; and Zagnoni, Graziano, 4,399,284, Cl. 546-134.000.

Alheid, Robert J., to Beloit Corporation. End dam seal for blade type fountain coaters. 4,398,494, Cl. 118-410.000.

Allen, Brian P.: *See*—
Evans, Trevor; and Allen, Brian P., 4,399,364, Cl. 250-492.100.

Allen Fruit Co., Inc.: *See*—
Prakken, Bouwe, 4,398,383, Cl. 53-537.000.

Allen, Joe R. Single line control unit for model aircraft. 4,398,370, Cl. 46-77.000.

Allen, Roland M.; and Kalocai, Andrew J., to West Company, The. System for making molded articles. 4,398,989, Cl. 156-500.000.

Allen, William R., Sr., to Cherokee Industries, Inc. Preservation of wood. 4,399,195, Cl. 428-541.000.

Allied Corporation: *See*—
Louder, Nevitt M.; Cuomo, Carlo E.; and Secosky, Paul F., 4,399,433, Cl. 340-626.000.
Ohta, Yukitake; Fukunaga, Yasuo; and Masubuchi, Hitoshi, 4,398,793, Cl. 350-96.200.
Thomas, Rudy V., 4,398,750, Cl. 280-802.000.

Allis-Chalmers Corporation: *See*—
Belsanti, James F., 4,398,507, Cl. 123-41.380.
Downing, Terry R.; and Geiersbach, Allois F., 4,398,860, Cl. 414-634.000.
Quick, David C., 4,398,432, Cl. 74-331.000.

Alperstein, Ellen J., executrix: *See*—
Canup, Robert E.; Mitchell, Edward; and Alperstein, Martin, deceased, 4,398,515, Cl. 123-357.000.

Alperstein, Martin, deceased: *See*—
Canup, Robert E.; Mitchell, Edward; and Alperstein, Martin, deceased, 4,398,515, Cl. 123-357.000.

Alsthom-Atlantique: *See*—
Masselin, Michel, 4,399,501, Cl. 363-141.000.

Altex Scientific Inc.: *See*—
MacDonald, Scott N.; and Magnussen, Haakon T., Jr., 4,399,502, Cl. 364-189.000.

Altmann, Erik: *See*—
Kluczynski, Achim; and Altmann, Erik, 4,398,679, Cl. 242-74.000.

Aluminum Company of America: *See*—
Ray, Siba P., 4,399,008, Cl. 204-67.000.

Aluminum Pechiney: *See*—
Leroy, Michel, 4,398,590, Cl. 165-4.000.
Alvarez, Luis W. Television viewer. 4,399,455, Cl. 358-60.000.
Amann, Franz; and Listl, Peter, to Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG. Polishing machine having a rotary reciprocating shaft. 4,398,374, Cl. 51-31.000.
Amann, Hans; and Burkhardt, Jurgen, to Preussag Aktiengesellschaft. Recovery of sediments from the bottom of the sea by suspended suction pipe. 4,398,361, Cl. 37-57.000.
Amax Inc.: *See*—
Neelameggham, Ramaswami; and Priscu, John C., 4,398,947, Cl. 75-53.000.
Ambrosiano, Nicholas A.; and Kassner, James E., to Sterling Drug Inc. Process for purification of quinoline yellow. 4,398,916, Cl. 8-602.000.
Amemiya, Yasuhiro: *See*—
Yoshida, Zenichi; Kato, Susumu; Fujiki, Takuya; and Amemiya, Yasuhiro, 4,399,075, Cl. 260-465.00F.
American Can Company: *See*—
Hirt, Edmund, 4,398,635, Cl. 206-532.000.
American Cyanamid Company: *See*—
Curran, William V.; and Ross, Adma S., 4,399,132, Cl. 424-246.000.
Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, LeRoy, 4,398,654, Cl. 222-402.100.
Schaefer, Frederic C., 4,399,073, Cl. 260-453.00P.
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Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,399,126, Cl. 424-180.000.
American Hoechst Corporation: *See*—
Gillich, Thomas N.; Walls, John E.; Wanat, Stanley F.; and Rozell, William J., 4,399,021, Cl. 204-38.00A.
Lew, Yung, 4,399,469, Cl. 358-282.000.
American Technical Industries, Inc.: *See*—
DeCosmo, Anthony, 4,399,172, Cl. 428-8.000.
AMF Incorporated: *See*—
Dan, Petre F., 4,398,781, Cl. 339-94.00M.
Seiling, Samuel O., 4,398,880, Cl. 425-439.000.
Amigo Sales, Inc.: *See*—
Paffrath, Edgar C., 4,398,858, Cl. 414-462.000.
Aminaka, Muneaki: *See*—
Sakurai, Hisaya; Hamada, Minoru; Matsuzaki, Kazuhiko; and Aminaka, Muneaki, 4,399,272, Cl. 528-233.000.
Amouroux, Jacques; and Morvan, Daniel, to Electricite de France (Service National). Zone purification of silicon in a reactive plasma. 4,399,116, Cl. 423-348.000.
AMP Incorporated: *See*—
Novotny, Lawrence G.; and Watts, Elvert S., 4,398,780, Cl. 339-49.00R.
Ampex Corporation: *See*—
Barzee, Verl N.; and Wonfor, Peter J., 4,398,815, Cl. 354-293.000.
Coleman, Charles H., Jr., 4,399,474, Cl. 360-46.000.
Wright, Kurt O.; Brehm, Timothy L.; Berger, Duaine E.; and Matsuoka, Paul S., 4,399,485, Cl. 361-383.000.
AMSTED Industries Incorporated: *See*—
DeFay, Paul T., Jr., 4,398,407, Cl. 72-75.000.
Analog Devices, Inc.: *See*—
Lapham, Jerome F.; and Clark, Tommy D., 4,399,345, Cl. 219-121.0LJ.
Ananthanarayanan, Ramaswamy: *See*—
Garware, Shashikant B.; and Ananthanarayanan, Ramaswamy, 4,399,265, Cl. 528-308.200.
Anderson, Maynard L., to Mobil Oil Corporation. Gravity assisted solvent flooding process. 4,398,602, Cl. 166-245.000.
Anderson, Paul; Christy, Marcia E.; and Evans, Ben E., to Merck & Co., Inc. 5-Alkyl or hydroxyalkyl substituted-10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5,10-imines and anticonvulsant use thereof. 4,399,141, Cl. 424-256.000.
Anderson, Richard N., to V. E. Anderson Mfg. Company. Window structure. 4,398,372, Cl. 49-65.000.
Ando, Hiromi: *See*—
Takayama, Toshio; and Ando, Hiromi, 4,398,449, Cl. 91-376.00R.
Ando, Masahisa: *See*—
Kuroiwa, Yosio; Kato, Keigo; and Ando, Masahisa, 4,398,522, Cl. 123-549.000.
Anelva Corporation: *See*—
Tsukada, Tsutomu; and Takei, Hideo, 4,399,016, Cl. 204-192.00R.
Annis, Gerald A., to Schlegal Corporation. Transmission selector rod seal. 4,399,337, Cl. 200-16.00B.
Anthony, John; and Kurtz, Stuart J., to Union Carbide Corporation. Multilayer films comprising low pressure, low density polyethylene. 4,399,173, Cl. 428-35.000.
Aoki, Katsumichi; Arabori, Hideo; Satake, Keigo; and Shinkawa, Hiroyasu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Herbicidal composition and method for inhibiting growth of weeds. 4,398,944, Cl. 71-118.000.
Arabori, Hideo: *See*—
Aoki, Katsumichi; Arabori, Hideo; Satake, Keigo; and Shinkawa, Hiroyasu, 4,398,944, Cl. 71-118.000.
Arai, Yoshinobu: *See*—
Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohisa; and Ito, Hiroyuki, 4,399,147, Cl. 424-285.000.
Arakawa, Akio: *See*—
Suzuki, Hajime; Iwano, Yoshimi; and Arakawa, Akio, 4,398,570, Cl. 139-370.200.
Araki, Youichi: *See*—
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Archer, Derek J.; and Jones, Leonard W. N., to James Burn Bindings Limited. Heavy duty closing machine with calendar hanger feed unit. 4,398,856, Cl. 412-39.000.
Archer, John D.: *See*—
Dalgoutte, David G.; Archer, John D.; Burke, Peter F. C.; and Pragnell, Robert G., 4,398,796, Cl. 350-96.200.
Argibay, John, Jr.; and Krejcar, Jan A. Handler for tennis and similar play balls. 4,398,716, Cl. 273-29.00A.
Arizumi, Shoji; Segawa, Makoto; Maiwa, Hisaaki; and Okamoto, Seishi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,399,520, Cl. 365-174.000.
Arlotte, Thomas F.: *See*—
Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,398,615, Cl. 180-127.000.
Arlt, Dieter: *See*—
Jautelat, Manfred; Stetter, Jorg; and Arlt, Dieter, 4,399,309, Cl. 568-322.000.
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Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,399,209, Cl. 430-138.000.
Arnold, Arthur J.; and Pye, Barry J., to National Research Development Corporation. Electrostatic spraying. 4,398,672, Cl. 239-701.000.
Asahi Chemical Company, Limited: *See*—
Yoshida, Zenichi; Kato, Susumu; Fujiki, Takuya; and Amemiya, Yasuhiro, 4,399,075, Cl. 260-465.00F.
Asahi-Dow Limited: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,399,181, Cl. 428-213.000.
Asahi Glass Company Ltd.: *See*—
Sato, Kimihiko; Terase, Kunihiko; and Kijimuta, Hitoshi, 4,399,115, Cl. 423-344.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nohmi, Takashi; and Yamada, Takao, 4,399,035, Cl. 210-500.200.
Sakurai, Hisaya; Hamada, Minoru; Matsuzaki, Kazuhiko; and Aminaka, Muneaki, 4,399,272, Cl. 528-233.000.
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Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, to Mitsui Toatsu Chemicals, Incorporated. Pressure sensitive recording unit. 4,398,753, Cl. 282-27.500.
Asher, William J.; and Venero, Agustin F., to Exxon Research and Engineering Co. Cyclic adsorption process. 4,398,927, Cl. 55-34.000.
Ashworth Bros., Inc.: *See*—
Ashworth, Robert C., III, 4,398,318, Cl. 19-114.000.
Ashworth, Robert C., III, to Ashworth Bros., Inc. Card clothing for carding machine elements. 4,398,318, Cl. 19-114.000.
Asker, Gunnar C. F. Wind propulsion devices. 4,398,895, Cl. 440-8.000.
Ateliers et Chantiers de Bretagne-ACB: *See*—
Pierart, Robert, 4,398,484, Cl. 114-65.00R.
Athey, Stuart E.; and McCord, Dick P., to Hobart Corporation. Method and apparatus for analysis of meat products. 4,398,835, Cl. 374-14.000.
Atkinson, Thomas J.: *See*—
Snow, Roger L., Sr.; and Atkinson, Thomas J., 4,399,092, Cl. 264-318.000.
Atlas Copco Aktiebolag: *See*—
Emmerich, Wolfgang, 4,398,411, Cl. 72-482.000.
Auger, Henri; and Acloque, Jean-Pierre, to Saint Gobain Vitrage. Solar mirror having contiguous reflecting panels mounted on a movable frame. 4,398,802, Cl. 350-292.000.
Augustine, Robert J.; and Mysicka, James C., to Sunbeam Corporation. Steam iron. 4,398,364, Cl. 38-77.500.
Auto-Cast International, Ltd.: *See*—
Heitzman, Charles J., 4,398,378, Cl. 52-251.000.
Automotive Products Limited: *See*—
Osborne, Duncan W., 4,398,623, Cl. 188-79.5GE.
Ava International Corporation: *See*—
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Avco Corporation: *See*—
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Aviation Electric Ltd.: *See*—
Maine, Arthur E., 4,398,352, Cl. 33-356.000.
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Smith, Frederick R.; Toy, Walter W.; and Witiak, David, 4,399,255, Cl. 525-54.210.
Axel, Richard; Wigler, Michael H.; and Silverstein, Saul J., to Columbia University, The Trustees of. Processes for inserting DNA into eucaryotic cells and for producing proteinaceous materials. 4,399,216, Cl. 435-6.000.
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Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., to Halliburton Company. Open sea skimmer barge. 4,399,040, Cl. 210-749.000.
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Jablonski, Dane E., 4,399,262, Cl. 525-349.000.
Mullender, Claude, 4,398,988, Cl. 156-405.100.

B/ler, Ulrich; Ribka, Joachim; Roth, Kurt; and Stahl, Theo, to Cassella Aktiengesellschaft. Process for producing discharge reserve prints on textile materials. 4,398,913, Cl. 8-456.000.

B Optical: *See*—
Hodges, Marvin P.; and Buchroeder, Richard A., 4,398,810, Cl. 350-452.000.

B-W Health Products, Inc.: *See*—
Mitchell, Larry D., 4,398,313, Cl. 5-66.000.

Babb, Albert L.; and Scribner, Belding H., to Diachem, Inc. Proportioning system for bicarbonate dialysate. 4,399,036, Cl. 210-638.000.

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Baby Relax: *See*—
Duvignacq, Maurice-Claude, 4,398,748, Cl. 280-644.000.

Bacevius, Joseph G. Clamping light construction and clamping means therefor. 4,399,498, Cl. 362-396.000.

Bagdy, Daniel: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,399,065, Cl. 260-112.50R.

Bagley, Julius B.: *See*—
Titus, Theodore, IV; and Bagley, Julius B., 4,399,527, Cl. 369-28.000.

Bailey, Donald H. Precision tools and precision tool sets, and methods of constructing and utilizing same. 4,398,349, Cl. 33-174.0TA.

Baillie, Alister C.; Wright, Brian J.; Wright, Kenneth; and Earnshaw, Christopher G., to FBC Limited. Phosphinic acid derivatives. 4,399,287, Cl. 548-119.000.

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Baker Perkins Holdings Limited: *See*—
Taylor, Peter A., 4,398,877, Cl. 425-145.000.

Baker, Ralph T. Fire escape. 4,398,621, Cl. 182-48.000.

Bakewell, Joseph J., to Dynamics Research Corporation. Thermal print head and method of fabrication. 4,399,348, Cl. 219-216.000.

Bakker, John A.; and French, Edward C., to Illinois Tool Works Inc. Center release buckle. 4,398,324, Cl. 24-230.00R.

Balasubramanian, N., to United States of America, Army. Optical leverage telecentric scanning apparatus. 4,398,787, Cl. 350-6.400.

Balde, John W.; and Vine, Irvin. Dental crown assembly. 4,398,887, Cl. 433-218.000.

Ball Corporation: *See*—
Cerny, Daryl D.; and Reynolds, Virgil C., Jr., 4,398,648, Cl. 220-67.000.

Ball, Robert. Trailers. 4,398,859, Cl. 414-523.000.

Ball Valve Co., Inc.: *See*—
Bunn, Stuart E.; and Owsley, Herbert B., 4,398,559, Cl. 137-516.150.

Ballantyne, James P.; Fleischer, Paul E.; Laker, Kenneth R.; and Yiannoulos, Aristides A., to Bell Telephone Laboratories, Incorporated. Integrated CRC filter circuit. 4,399,417, Cl. 330-109.000.

Ballman, Gray C. Electronic motor start switch. 4,399,394, Cl. 318-786.000.

Balopole, Harvey L.; and Traynor, Thomas H., to Fairchild-Weston Systems Inc. Video split screen technique. 4,399,462, Cl. 358-183.000.

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Perry, Wilbert O., 4,398,655, Cl. 224-191.000.

Bar, Alfredo, to Necchi Societa per Azioni. Terminal board and relays casing assembly in motor compressors for refrigerators. 4,398,400, Cl. 62-508.000.

Barabas, Eva: *See*—
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Bardl, Artur, to Siemens Aktiengesellschaft. Monolithically integrated semiconductor circuit. 4,399,518, Cl. 365-45.000.

Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased (by Lee, Janice N., executrix), to General Foods Corporation. Pressurized container providing for the separate storage of a plurality of materials. 4,399,158, Cl. 426-112.000.

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Barker, Randall R. Drinking device for divers. 4,398,533, Cl. 128-202.150.

Barlow, Jeffrey J.; and Smith, Leslie H., to Imperial Chemical Industries PLC. Alkanolamine derivatives. 4,399,138, Cl. 424-250.000.

Barnard, Robert G. Truck design for a skate-type device. 4,398,734, Cl. 280-11.280.

Barnes, Elwood E., to Mars, Inc. Low frequency phase shift coin examination method and apparatus. 4,398,626, Cl. 194-100.00A.

Baron, Walter J.; and Cleaver, Laird C., to Water Services of America, Inc. Basket retainer for heat exchanger tube cleaning element. 4,398,592, Cl. 165-95.000.

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Berry, Peter J.; and Montgomery, John Y. C., 4,399,458, Cl. 358-113.000.
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Barry Wright Corporation: *See*—
Gureghian, Richard S., 4,398,755, Cl. 285-223.000.

Barta, Franz, to Franz Barta Kommanditgesellschaft. Decalcamania picture for applying designs or imprints to objects of glass, ceramics or such-like, process for transferring decalcamania picture of that kind, and apparatus for carrying out said process. 4,399,178, Cl. 428-202.000.

Bartky, Scott: *See*—
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Bartman, Gerrit E.: *See*—
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Bary, James F., to Columbus McKinnon Corporation. Chain travel stop. 4,398,387, Cl. 59-93.000.

Barzee, Verl N.; and Wonfor, Peter J., to Ampex Corporation. Camera mount. 4,398,815, Cl. 354-293.000.

BASF Aktiengesellschaft: *See*—
Blum, Adolf; Kutschera, Peter; and Vogl, Guenther, 4,398,914, Cl. 8-456.000.
Gimpel, Jurgen; Feuerherd, Karl-Heinz; and Schenck, Hans-Uwe, 4,399,256, Cl. 525-111.000.
Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,399,001, Cl. 203-70.000.
Steiner, Gerd; Gries, Josef; and Lenke, Dieter, 4,399,137, Cl. 424-250.000.
Steiner, Gerd; Friedrich, Ludwig; and Lenke, Dieter, 4,399,139, Cl. 424-250.000.
Thoemel, Frank; Seib, Karl; Schneider, Kurt; and Naegele, Paul, 4,399,297, Cl. 560-55.000.

BASF Wyandotte Corporation: *See*—
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Bassinger, Grey. Roller reamer apparatus. 4,398,610, Cl. 175-228.000.

Batra, Vijay K., to Stride Rite International, Ltd. Outsole. 4,398,357, Cl. 36-30.00A.

Bauer, Walter, to AGFA-Gevaert Aktiengesellschaft. Means for converting X-rays into radiation which darkens X-ray films. 4,399,363, Cl. 250-483.100.

Baum, Heinz W., to Lucas Industries Limited. Disc brake pad assemblies. 4,398,622, Cl. 188-73.380.

Baur, Karl; Lassmann, Eberhard; and Karwat, Heinz, to Linde Aktiengesellschaft. Process for removal of sour gases by scrubbing. 4,399,111, Cl. 423-226.000.

Baxter, Ronald A., to Mead Corporation, The. Article case and blank therefor. 4,398,636, Cl. 206-614.000.

Bayer Aktiengesellschaft: *See*—
Bier, Peter, 4,399,244, Cl. 524-89.000.
Coblenz, Rolf; Schulte, Klaus; Ebeling, Wilfried; and Evertz, Dieter, 4,399,104, Cl. 422-111.000.
Forster, Heinz; Hofer, Wolfgang; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,399,285, Cl. 546-210.000.
Humme, Gert; Plato, Horst; Ott, Karl-Heinz; Kowitz, Friedrich; and Hagenberg, Peter, 4,399,273, Cl. 528-486.000.
Jautelat, Manfred; Stetter, Jorg; and Arlt, Dieter, 4,399,309, Cl. 568-322.000.
Kramer, Erich, 4,399,068, Cl. 260-158.000.
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Bayerische Motoren Werke Aktiengesellschaft: *See*—
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Bays, David E.; Clitherow, John W.; and Judd, Duncan B., to Glaxo Group Limited. Process for the preparation of a furan derivative. 4,399,294, Cl. 549-495.000.

BBC Brown, Boveri & Company Limited: *See*—
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Beard, Michael A., to DCA Design Consultants Limited. Locking device. 4,398,323, Cl. 24-211.00L.

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Beccaris, Carlo, to VALEO Societe Anonyme. Torsion damping device for a motor vehicle clutch. 4,398,625, Cl. 192-106.200.

Becker, Manfred; Melchior, Klaus; and Siegers, Leonhard, to Kraftwerk Union Aktiengesellschaft. Blowdown device for steam power plants. 4,399,082, Cl. 261-124.000.

Becker, Wilhelm; Hubner, Herbert; and Marten, Manfred, to Hoechst Aktiengesellschaft. Process for preparing moulded bodies and coatings. 4,399,268, Cl. 528-99.000.

Beckett, Donald E. Formation of packaging material. 4,398,994, Cl. 156-659.100.

Becton Dickinson and Company: *See*—
Nugent, Edward L.; and Kaufman, Joseph, 4,398,544, Cl. 128-763.000.

Bee Line Company: *See*—
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Belbin, Geoffrey R.; and Cogswell, Frederic N., to Imperial Chemical Industries PLC. Process of producing fibre-reinforced shaped articles. 4,399,085, Cl. 264-41.000.
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Bell, John D.; and O'Truk, Michael A., to Rockwell International Corporation. Railway propulsion system suspension. 4,398,468, Cl. 105-136.000.
Bell, Michael L.: *See*—
Kelton, Arden A.; Bell, Michael L.; and Chung, Roy A., 4,399,229, Cl. 436-519.000.
Bell, Ted A.; Cooksey, Timothy S.; and Lehner, Daniel F., to Pretty Products, Inc. Automotive floor mat having rigid rib. 4,399,176, Cl. 428-85.000.
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Bordelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,398,972, Cl. 148-31.550.
Buckley, Reginald R.; D'Asaro, Lucian A.; Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodiuk, Catherine, 4,399,004, Cl. 204-15.000.
Clarke, Patrick W.; and Schroeder, Robert E., 4,399,500, Cl. 363-97.000.
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Feldman, Martin; White, Alan D.; and White, Donald L., 4,398,824, Cl. 356-401.000.
Gallagher, Patrick K.; and Robbins, Murray, 4,399,097, Cl. 420-555.000.
Henry, Paul S., 4,399,323, Cl. 178-22.140.
Ling, Dean D., 4,398,779, Cl. 339-17.0LC.
MacDonald, Verne H.; Porter, Philip T.; and Young, W. Rae, 4,399,555, Cl. 455-33.000.
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Pelletier, James A., 4,399,402, Cl. 324-52.000.
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Beloit Corporation: *See*—
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Cronin, Dennis C., 4,398,997, Cl. 162-274.000.
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Belsky, Jerome; and Belsky, D. Michel. Vehicle towing system. 4,398,743, Cl. 280-495.000.
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Gaiser, Robert F., 4,398,390, Cl. 60-562.000.
Grabb, Frederick G., 4,398,871, Cl. 417-283.000.
Waters, Edwin R., 4,399,318, Cl. 174-35.00C.
Bennett, Keith E.; and Byer, Robert L., to Leland University, The Board of Trustees of the. Broadband variable optical attenuator. 4,398,806, Cl. 350-394.000.
Bennett, Phillip D., to Standard Oil Company, The. Sulfide and selenide compositions. 4,399,203, Cl. 429-191.000.
Bentham, John; Coates, Jacqueline A.; and Connell, David L., to Sandoz Products Limited. Bleach composition. 4,399,050, Cl. 252-95.000.
Bentley, Arthur P. Variable volume sonic pressure wave surface operated pump. 4,398,870, Cl. 417-240.000.
Berg, Charles A. Energy conservation in shower bathing. 4,398,308, Cl. 4-598.000.
Berg, Charles A., to Pyreflex Corporation. Insulating structure for high temperature devices. 4,398,474, Cl. 110-336.000.
Berg, Howard M.; Lewis, Gary L.; and Mitchell, Curtis W., to Motorola, Inc. Low thermal impedance plastic package. 4,399,453, Cl. 357-81.000.
Bergendahl, Albert S., to International Business Machines Corporation. Method and apparatus for determining photomask alignment. 4,399,205, Cl. 430-30.000.
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Bergvall, Bengt A.; and Skogward, Kenneth O. E., to Husqvarna Aktiebolag. Device for measuring movement of material using a wheel rolling on the material. 4,398,348, Cl. 33-133.000.
Bernal, Eddie L., to Taco Operations, Inc. Readily portable burrito. 4,399,156, Cl. 426-91.000.
Bernard, Jean; Beyl, Jean J. A.; Buzon, Philippe; and le Faou, Daniel, to Ste Look. Toe fitting of safety ski binding. 4,398,747, Cl. 280-630.000.
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Beuch, Donald R. Method of inhibiting kinking and twisting of a cable relative to an anchor. 4,398,336, Cl. 29-433.000.
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., to Gulf Research & Development Company. Process for preparing gasoline range hydrocarbons from synthesis gas and catalyst used therefor. 4,399,234, Cl. 518-715.000.
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Bezman, Susan A., to Chevron Research Company. Extractive blending process. 4,398,922, Cl. 44-56.000.
BICC Public Limited Company: *See*—
Seddon, Alan E., 4,398,624, Cl. 191-40.000.
Biehl, Reinhard; and Schmalbein, Dieter, to Bruker Analytische MeBtechnik GmbH. Test head for electron spin resonance and paramagnetic electron resonance measurements. 4,399,406, Cl. 324-316.000.
Bielat, Norbert J. Line indicating apparatus. 4,399,434, Cl. 340-701.000.
Bier, Peter, to Bayer Aktiengesellschaft. Glass fiber reinforced polyethylene terephthalate compositions having improved heat distortion temperatures. 4,399,244, Cl. 524-89.000.
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Bildusas, Leon L., to Eschem Inc. Resealable pressure sensitive adhesives and products. 4,399,249, Cl. 524-271.000.
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Bird, David A. Low-noise pulse conditioner. 4,399,414, Cl. 328-151.000.
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Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, to Siemens Aktiengesellschaft. Device for electrodeposition of aluminum. 4,399,018, Cl. 204-199.000.
Bishop and Associates, Inc.: *See*—
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Bishop, Thomas R.; and Peil, Archie W., to Bowen Tools, Inc. Blowout preventer inner ram seal assembly. 4,398,729, Cl. 277-73.000.
Bithrey, Alan R., to British Aerospace Public Limited Company. Displacement mechanism. 4,398,682, Cl. 244-3.290.
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Black, Kenneth C. Multiple shut-off valve. 4,398,560, Cl. 137-595.000.
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Blahut, Donald E.; Harrison, Marc L.; Killian, Michael J.; and Thierbach, Mark E., to Bell Telephone Laboratories, Incorporated. Stored-program control machine. 4,399,516, Cl. 364-716.000.
Blake, Larry W.; Harvel, Ervin R.; Mason, Duane R.; and Wright, George M. Wound drain catheter. 4,398,910, Cl. 604-93.000.
Blakely, John R. Poultry incubation and hatching tray. 4,398,499, Cl. 119-43.000.
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Bode, Harald E. W. Audio signal processing system. 4,399,326, Cl. 179-1.00D.
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Bodie, Elizabeth A.: *See*—
Schwartz, Robert D.; and Bodie, Elizabeth A., 4,399,160, Cl. 426-41.000.
Bodnar, Bert S.: *See*—
Floyd, Larry K.; and Bodnar, Bert S., 4,398,757, Cl. 285-315.000.
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Gauhl, Helmgard; Seidel, Hans; Lang, Gunter; Roder, Albert; and Ziegenhorn, Joachim, 4,399,218, Cl. 435-25.000.
Boeke, Wouter M., to U.S. Philips Corporation. Current stabilizer comprising enhancement field-effect transistors. 4,399,374, Cl. 307-297.000.

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Boggs, Ronald M.: *See*—
Lomax, Donald P.; and Boggs, Ronald M., 4,399,198, Cl. 428-595.000.

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Darling, Stephen D.; Jendrisak, Aloysius A.; and Bokmiller, David J., 4,398,888, Cl. 434-278.000.

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Burke, Richard E.; Harris, Edward H.; and Bolton, Joseph W., 4,398,472, Cl. 110-250.000.

Bond, Michael P., to A.P.V. Company Limited, The. Heat exchanger frame components. 4,398,591, Cl. 165-78.000.

Bonner, Edgar L. Coded signal radio transmitter for remote control mechanisms. 4,399,438, Cl. 340-825.720.

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Bose, Ranendra K. Anti-pollution and energy conservation system. 4,399,107, Cl. 422-170.000.

Bosselaers, Robert J., to RCA Corporation. High speed sampling head. 4,399,413, Cl. 328-151.000.

Bosshard, Hans: *See*—
Zweifel, Hans; Berger, Joseph; and Bosshard, Hans, 4,399,259, Cl. 525-289.000.

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Edelson, Richard L., 4,398,906, Cl. 604-6.000.

Bourke, Frederic A., Jr.: *See*—
Edelson, Richard L., 4,398,906, Cl. 604-6.000.

Bowen Tools, Inc.: *See*—
Bishop, Thomas R.; and Peil, Archie W., 4,398,729, Cl. 277-73.000.

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Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, 4,399,356, Cl. 250-201.000.

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Szilagyi, Dezso; Cunningham, John P.; and Bowlby, Robert L., 4,398,696, Cl. 251-307.000.

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Stouffer, Ronald D., 4,398,664, Cl. 239-11.000.

Boyd, Michael D. Radiant energy reflector device. 4,398,587, Cl. 160-178.00R.

BPE, Inc.: *See*—
Finlay, Robert L., 4,398,354, Cl. 33-180.00R.

Br Persons Cementvarufabrik AB: *See*—
Persson, Bengt, 4,398,878, Cl. 425-385.000.

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Bradshaw, Norman F., to Haden Schweitzer Corporation. Energy recovery heat exchanger installation. 4,398,452, Cl. 98-115.0SB.

Bramfitt, Bruce L.: *See*—
Marder, Arnold R.; and Bramfitt, Bruce L., 4,398,970, Cl. 148-12.00F.

Branchick, Kenneth J.; Malkin, Irving; Sutter, Robert C.; Korinek, Karel A.; Suchanski, Mary R.; Knaack, Donald M.; and Platek, Gary F., to Diamond Shamrock Corporation. Device for waste water treatment. 4,399,020, Cl. 204-269.000.

Brandon, Harold J., to Barry-Wehmiller Company. Filler tube with check valve for container filling devices. 4,398,575, Cl. 141-39.000.

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Hauck, Robert B.; Gray, Floyd L.; and Brandt, Richard T., 4,399,550, Cl. 378-5.000.

Brasch, William: *See*—
Nobel, Fred I.; and Brasch, William, 4,399,006, Cl. 204-29.000.

Braune, Gerhard: *See*—
Voll, Horst; and Braune, Gerhard, 4,398,774, Cl. 308-184.00R.

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Wright, Kurt O.; Brehm, Timothy L.; Berger, Duaine E.; and Matsuoka, Paul S., 4,399,485, Cl. 361-383.000.

Brems, John H. Workpiece vertical conveyor system. 4,398,630, Cl. 198-796.000.

Brennan, John J.: *See*—
Prewo, Karl M.; and Brennan, John J., 4,399,231, Cl. 501-32.000.

Brennan, Thomas M.; and Hendrick, Michael E., to Pfizer Inc. Branched amides of L-aspartyl-D-amino acid dipeptides. 4,399,163, Cl. 426-548.000.

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Breton, Jean-Paul: *See*—
Roullet, Gerald; Breton, Jean-Paul; and Maciaszek, Adalbert, 4,399,566, Cl. 455-613.000.

Briant, James K.: *See*—
Moss, Owen R.; and Briant, James K., 4,398,498, Cl. 119-15.000.

Bridgestone Tire Company Limited: *See*—
Tansei, Hikaru; and Motomura, Kenichi, 4,398,584, Cl. 152-362.0CS.
Yuto, Kazuaki; Oniki, Toru; Ikeda, Nobumasa; and Miyake, Itsuo, 4,398,582, Cl. 152-209.00R.

Briggs, William F.; and Bullard, Edward M., to Mobil Oil Corporation. Coextruded thermoplastic stretch-wrap. 4,399,180, Cl. 428-212.000.

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Bithrey, Alan R., 4,398,682, Cl. 244-3.290.

British Gas Corporation: *See*—
Jones, Gregory E., 4,399,537, Cl. 371-14.000.

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Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,398,615, Cl. 180-127.000.

British Nuclear Fuels Limited: *See*—
Gillies, George M., 4,398,503, Cl. 122-31.00R.

Broadt, David R., to GTE Products Corporation. Opaque reflector for multilamp photoflash array. 4,399,490, Cl. 362-11.000.

Brodoway, Nicolas, to Du Pont de Nemours, E. I., and Company. Modification of ethylene/acrylate/carboxylic polymer. 4,399,263, Cl. 525-382.000.

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van Laar, Jacobus; Vander, Timen; Kroes, Johannes A.; and Broersen, Pieter G., 4,398,999, Cl. 202-267.00R.

Brother Kogyo Kabushiki Kaisha: *See*—
Torii, Hiroshi; and Mori, Masaharu, 4,398,837, Cl. 400-74.000.

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Brown, Frederick C.; and Lien, Neil C., to Baker Manufacturing Company. Extended range monochromator. 4,398,823, Cl. 356-334.000.

Brown, Glen J. L.: *See*—
Hodson, Ralph; Davies, Kenneth J.; Brown, Glen J. L.; Carroll, William L.; and Noble, Robert, 4,398,958, Cl. 106-90.000.

Brown, Kenneth D.; and O'Neill, Terence C., to Internationale Octrooi Maatschappij "Octropa" B.V. Decorative laminate of thermoplastic material. 4,399,182, Cl. 428-215.000.

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Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., 4,399,525, Cl. 367-75.000.

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Brugger, Leonard J.: *See*—
Warnock, Richard B.; and Brugger, Leonard J., 4,399,454, Cl. 358-16.000.

Bruker Analytische MeBtechnik GmbH: *See*—
Biehl, Reinhard; and Schmalbein, Dieter, 4,399,406, Cl. 324-316.000.

Bryan, Donald A.; and Maxey, William C., to Rubatex Corporation. Positioning guide for rubber-like material rotary cutting machine. 4,398,439, Cl. 83-356.300.

Bryant, Clifford A.; Bearden, Gary M.; and Pacifici, Joseph A., to West Point Pepperell, Inc. Apparatus for uniformly applying either liquid or foam compositions to a moving web. 4,398,665, Cl. 239-193.000.

Bryer, Philip. Split band actu.. .r. 4,399,477, Cl. 360-106.000.

BS&B Engineering Company, Inc.: *See*—
Hannigan, Norman J., 4,398,923, Cl. 48-87.000.

BTS Systementwicklungs GmbH: *See*—
Preuss, Heinz, 4,399,471, Cl. 358-298.000.

Bucchianeri, Richard M.: *See*—
Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., 4,398,542, Cl. 128-675.000.

Buchanan, Harry C., Jr.; Graham, Donald E.; Cook, Keith R.; and Claude, George T., to General Motors Corporation. Vehicle pneumatic suspension system with dead band adjustment. 4,398,704, Cl. 267-64.210.

Bucher, Hermann, to Lamba Physik Gesellschaft zur Herstellung von Lasern mbH & Co. KG. Tunable laser oscillator. 4,399,540, Cl. 372-20.000.

Bucholz, James A. Separator assembly for use in spent nuclear fuel shipping cask. 4,399,366, Cl. 250-507.100.

Buchroeder, Richard A.: *See*—
Hodges, Marvin P.; and Buchroeder, Richard A., 4,398,810, Cl. 350-452.000.

Bucking, Hans-Walter: *See*—
Keil, Karl-Heinz; May, Adolf; and Bucking, Hans-Walter, 4,399,043, Cl. 252-8.700.

Buckles, Richard G. Optical fiber apparatus for quantitative analysis. 4,399,099, Cl. 422-58.000.
Buckley, Reginald R.; D'Asaro, Lucian A.; Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodiuk, Catherine, to Bell Telephone Laboratories, Incorporated. Photoelectrochemical gold plating process. 4,399,004, Cl. 204-15.000.
Bucknam, Donald C. Power plant and process utilizing gravitational force. 4,399,368, Cl. 290-1.00R.
Buelens, Edward: *See—*
Muylle, Wilfried E.; and Buelens, Edward, 4,398,814, Cl. 354-275.000.
Buhrer, Carl F., to GTE Laboratories Incorporated. Arc lamp power supply. 4,399,392, Cl. 315-308.000.
Bullard, Edward M.: *See—*
Briggs, William F.; and Bullard, Edward M., 4,399,180, Cl. 428-212.000.
Bulleyment, Keith J., to Honeywell Inc. Noise reduction method and apparatus. 4,399,370, Cl. 307-112.000.
Bunker Ramo Corporation: *See—*
Hawley, Kenneth R., 4,399,503, Cl. 364-200.000.
Bunn, Stuart E.; and Owsley, Herbert B., to Ball Valve Co., Inc. Valve member and assembly with inlet an outlet pressure relief grooves. 4,398,559, Cl. 137-516.150.
Burdette, George W.; and Schneider, Abraham I., to United States of America, Navy. High density, low viscosity airbreather fuel (RJ-4-I). 4,398,978, Cl. 149-109.600.
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Clin, Francois H.; Gony, Jean-Noel M.; Proust, Francois O.; Cuvillier, Roger O.; and Larrose, Philippe J., 4,399,029, Cl. 209-234.000.
Burford, Charles E. Tab attachment device. 4,398,379, Cl. 53-77.000.
Burke, Peter F. C.: *See—*
Dalgoutte, David G.; Archer, John D.; Burke, Peter F. C.; and Pragnell, Robert G., 4,398,796, Cl. 350-96.200.
Burke, Richard E.; Harris, Edward H.; and Bolton, Joseph W., to Hudson Wire Company. Electric burner for oxidizing oven. 4,398,472, Cl. 110-250.000.
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Burkhardt, Jurgen: *See—*
Amann, Hans; and Burkhardt, Jurgen, 4,398,361, Cl. 37-57.000.
Burkhart, Gerald W.: *See—*
Ceska, Gary W.; and Burkhart, Gerald W., 4,398,957, Cl. 106-90.000.
Burns, Michael E., to Procter & Gamble Company, The. Concentrated fabric softening compositions. 4,399,045, Cl. 252-8.750.
Busch, Hans: *See—*
McKenzie, Ross A.; and Busch, Hans, 4,398,739, Cl. 280-154.50R.
Butcher, James S.; Chan, Andrew; and Lind, Paul U., to GTE Automatic Electric Labs Inc. Bi-lateral four quadrant power converter. 4,399,499, Cl. 363-17.000.
Buzon, Philippe: *See—*
Bernard, Jean; Beyl, Jean J. A.; Buzon, Philippe; and le Faou, Daniel, 4,398,747, Cl. 280-630.000.
B.V. Neratoom: *See—*
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Byer, Robert L.: *See—*
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Cablescan, Inc.: *See—*
Rockwell, Kenneth N.; and Minuskin, Harold, 4,399,400, Cl. 324-51.000.
Cadeddu, Leonardo, to Benditalia S.p.A. Safety valve for vacuum control circuits. 4,398,558, Cl. 137-498.000.
Cahill, Paul J., to Standard Oil Company (Indiana). Diesel fuel composition. 4,398,505, Cl. 123-1.00A.
Calame, Jean-Pierre: *See—*
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Jones, Lawrence T.; Howden, Ashley; Knighton, Mark S.; Sims, Anson; Kittinger, David L.; and Hollander, Richard E., 4,398,720, Cl. 273-238.000.
Calspan Corporation: *See—*
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Camboulives, Andre A. M. L.; Hallinger, Claude C.; and Vandenbroucke, Roger A. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Sealing device between two elements of a turbomachine. 4,398,864, Cl. 415-134.000.
Campau, Daniel N., to Pepsico, Inc. Method of making iron golf clubs with flexible impact surface. 4,398,965, Cl. 148-3.000.
Campbell, Frederick R., to Crown Zellerbach Corporation. Divider box assembly system. 4,398,901, Cl. 493-90.000.
Campbell, John E.: *See—*
Hughes, Paul R.; and Campbell, John E., 4,399,428, Cl. 340-500.000.
Cannata, Vincenzo; and Zagnoni, Graziano, to Alfa Farmaceutici S.p.A. Process for the optical resolution of mixtures of D- and L-2-(6-methoxy-2-naphthyl)-propionic acids. 4,399,284, Cl. 546-134.000.
Canon Kabushiki Kaisha: *See—*
Fujibayashi, Kazuo, 4,398,808, Cl. 350-427.000.
Katagiri, Kazuharu; Watanabe, Katsunori; Ishikawa, Shozo; and Kitahara, Makoto, 4,399,206, Cl. 430-58.000.
Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Kitahara, Makoto, 4,399,207, Cl. 430-58.000.
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Cantelia, Michael J.: *See—*
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Canup, Robert E.; Mitchell, Edward; and Alperstein, Martin, deceased (by Alperstein, Ellen J., executrix), to Texaco Inc. Internal combustion engine fuel control system. 4,398,515, Cl. 123-357.000.
Canzek, Ludvik. High speed catadioptric system. 4,398,809, Cl. 350-444.000.
Caporaso, John A., to Nabisco Brands, Inc. Packaging system for fully baked, unfilled pastry shells. 4,399,157, Cl. 426-108.000.
Carblox Limited: *See—*
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Carignan, Forest J.: *See—*
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Carl Freudenberg, Firma: *See—*
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Carmel Energy, Inc.: *See—*
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Caroleo, Steven J.; and Schmitt, Edward L., to Kerotest Manufacturing Corp. Electrically insulated pipe coupling and method for making the same. 4,398,754, Cl. 285-45.000.
Carrico, Robert J.: *See—*
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Carrier Corporation: *See—*
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Carroll, William L.: *See—*
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Carson, William G., to Goodyear Tire & Rubber Company, The. Increasing the reactivity of coupling of block polymers. 4,399,260, Cl. 525-340.000.
Cascut Corporation: *See—*
Cutts, Edmund A., 4,398,490, Cl. 114-358.000.
Casey, William R., to Goodyear Tire & Rubber Company, The. Apparatus for applying an extruded strip to an inside tire surface. 4,398,492, Cl. 118-105.000.
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Casinelli, Dominic L., to Harrell, James E. Heater plate assembly. 4,398,593, Cl. 165-104.110.
Cassella Aktiengesellschaft: *See—*
B/ler, Ulrich; Ribka, Joachim; Roth, Kurt; and Stahl, Theo, 4,398,913, Cl. 8-456.000.
Castleberry, Kimberly N. Compressor surge counter. 4,399,548, Cl. 377-16.000.
Caterpillar Tractor Co.: *See—*
Bloom, John J., Jr., 4,398,843, Cl. 404-117.000.
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Larson, Larry A.; and Murphy, Brian J., 4,398,930, Cl. 55-192.000.
Cathers, William P.; and Ferretti, John S., to PPG Industries, Inc. Vacuum channel method of laminating glass sheets. 4,398,979, Cl. 156-87.000.
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Fowler, Hubert H.; and Hunter, Joe M., 4,399,242, Cl. 523-404.000.
Cempol Sales Limited: *See—*
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Central Glass Company, Limited: *See—*
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,399,089, Cl. 264-57.000.
Centre Electronique Horloger SA: *See—*
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Cerny, Daryl D.; and Reynolds, Virgil C., Jr., to Ball Corporation. Flange structure for plastic container. 4,398,648, Cl. 220-67.000.
Ceska, Gary W.; and Burkhart, Gerald W., to Polysar International S.A. Mortar latex mix. 4,398,957, Cl. 106-90.000.
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Chabrerie, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche ANVAR. Homopolar dynamoelectric machine. 4,399,381, Cl. 310-178.000.
Chalmers, Edward L., II, to Lange International S.A. Plastic ski boot. 4,398,359, Cl. 36-117.000.
Champion International Corporation: *See—*
Schillinger, Joseph F., 4,398,661, Cl. 229-27.000.
Champion Spark Plug Company: *See—*
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Chem Systems Inc.: *See*—
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Kurandt, Hans-Friedrich, 4,399,110, Cl. 423-167.000.
Chen, Hao-Lin. Nitrogen fixation method and apparatus. 4,399,012, Cl. 204-179.000.
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Cherry Electrical Products Corporation: *See*—
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Cheung, Harry, to Union Carbide Corporation. Hydrogen-water isotopic exchange process. 4,399,120, Cl. 423-648.00A.
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Bezman, Susan A., 4,398,922, Cl. 44-56.000.
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Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,399,133, Cl. 424-246.000.
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Chickasha Rentals, Inc.: *See*—
Murray, Edwin G., 4,398,599, Cl. 166-95.000.
Child, Edward T., to Texaco Development Corporation. Process for the production of fuels from tar sands. 4,399,314, Cl. 208-11.0LE.
Chin, Gilbert Y.: *See*—
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Sugimori, Shigeru; Honda, Yukio; and Kojima, Tetsuhiko, 4,399,298, Cl. 560-59.000.
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Shiroto, Yoshimi; Higashi, Takehito; and Ono, Takeo, 4,399,026, Cl. 208-216.0PP.
Cholakian, Gary H.; Rubinstein, Arthur; and Steinmetz, John H., to Pitney Bowes Inc. Control system for inhibiting processing communications. 4,399,538, Cl. 371-66.000.
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., to G.D. Searle & Co. 4H-1,4-Benzothiazine derivatives and intermediates thereto. 4,399,279, Cl. 544-51.000.
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Chu, Chin-Chiun, to Mobil Oil Corporation. Zeolite catalysts modified with group IIIA metal. 4,399,059, Cl. 252-455.00Z.
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.
Cieszko, Joseph T.: *See*—
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Moll, Thorleif, 4,398,567, Cl. 138-113.000.
Clairol Inc.: *See*—
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Clark Equipment Company: *See*—
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Clark, Milton B., to Union Carbide Corporation. Solid cathode comprising a lead fluoride/tin fluoride compound. 4,399,204, Cl. 429-197.000.
Clark, Tommy D.: *See*—
Lapham, Jerome F.; and Clark, Tommy D., 4,399,345, Cl. 219-121.0LJ.
Clarke, Patrick W.; and Schroeder, Robert E., to Bell Telephone Laboratories, Incorporated. Multimode base drive circuit for power switching transistor. 4,399,500, Cl. 363-97.000.
Claude, Bruno; Pellerin, Daniel; and Labaig, Jean-Jacques, to Compagnie Francaise de Raffinage. Two-layer closure, particularly for closing plastic containers. 4,398,644, Cl. 215-232.000.
Claude, George T.: *See*—
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Clauss, Robert C.; and Quinn, Rex B., to United States of America, National Aeronautics and Space Administration. Resonant isolator for maser amplifier. 4,399,415, Cl. 330-4.000.
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Clem, Victor L. Chain drive for a bicycle. 4,398,740, Cl. 280-261.000.
Clin, Francois H.; Gony, Jean-Noel M.; Proust, Francois O.; Cuvillier, Roger O.; and Larrose, Philippe J., to Bureau de Recherches Geologiques et Minieres. Apparatus for the concentration and sorting of solid waste materials according to their shapes, their sizes and their flexibility. 4,399,029, Cl. 209-234.000.
Clitherow, John W., to Glaxo Group Limited. Process for the preparation of a furan derivative. 4,399,293, Cl. 549-494.000.
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Leopoldi, Norbert; and Heinrich, William P., 4,399,495, Cl. 362-189.000.
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Coblenz, Rolf; Schulte, Klaus; Ebeling, Wilfried; and Evertz, Dieter, to Bayer Aktiengesellschaft. Device for the production of a reaction mixture from flowable foam-forming or solid-forming components. 4,399,104, Cl. 422-111.000.
Coffee, Ronald A., to Imperial Chemical Industries Limited. Holders for containers used in electrostatic spraying. 4,398,671, Cl. 239-690.000.
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Belbin, Geoffrey R.; and Cogswell, Frederic N., 4,399,085, Cl. 264-41.000.
Cole, Herbert S., to General Electric Company. Transflective liquid crystal display. 4,398,805, Cl. 350-345.000.
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Coleman, Charles H., Jr., to Ampex Corporation. Automatic threshold tracking system. 4,399,474, Cl. 360-46.000.
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Columbia University, The Trustees of: *See*—
Axel, Richard; Wigler, Michael H.; and Silverstein, Saul J., 4,399,216, Cl. 435-6.000.
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Compagnie des Montres Longines Francillon SA: *See*—
Maire, Aurele; Michel, Jean-Georges; and Robert-Grandpierre, Jean-Claude, 4,398,832, Cl. 368-76.000.
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Conklin, Michael T.; and Mowry, Charles F., to Fire Out Enterprises Company, Inc. Fire extinguishing composition and method. 4,398,605, Cl. 169-47.000.
Conlon, Daniel R. Pliable weight for laboratory ware. 4,398,643, Cl. 215-100.00R.
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Continental Group, Inc., The: *See*—
Fridl, James J.; Nonnemann, Heinz W.; Payne, Robert D.; and Szpitalak, Wesley J., 4,398,491, Cl. 116-67.00R.
Converse, Gregg A.; and Converse, Maurice. Box top opener. 4,398,314, Cl. 7-151.000.
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Cook, Nathan H.; and Carignan, Forest J., to Advanced Mechanical Technology, Inc. Force platform construction and method of operating same. 4,398,429, Cl. 73-862.040.
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Copper Range Company: *See*—
Talvensaari, Robert D., 4,398,850, Cl. 405-261.000.
Cordier, Jean; and Rollot, Pierre, to Union Siderurgique du Nord et de l'Est de la France "USINOR". Cooling installation for a blast furnace by means of stave coolers. 4,398,701, Cl. 266-193.000.
Cordier, Rose: *See*—
Jarret, Bertrand; and Cordier, Rose, 4,399,565, Cl. 455-612.000.
Cormier, Alan D.; Czaban, John D.; Schillinger, Thomas J.; Legg, Kenneth D.; and Kelley, Thomas F., to Instrumentation Laboratory Inc. Liquid handling apparatus. 4,399,362, Cl. 250-430.000.
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Cosgrove, Michael R., deceased (by Cosgrove, Dorothy M., administratrix); Frey, Alexander H., Jr.; Moore, Kenneth A.; Peled, Abraham; Ris, Frederic N.; and Sproul, William W., III, to International Business Machines Corporation. Instruction address stack in the data memory of an instruction-pipelined processor. 4,399,507, Cl. 364-200.000.
Costello, Norman F., to Modine Manufacturing Company. Oil temperature regulator. 4,398,662, Cl. 236-345.000.
Costruzioni Meccaniche F.B.M.S.p.A.: *See*—
Mischiatti, Mario, 4,398,501, Cl. 122-7.00R.
Cosway, Thomas M. System for improving combustion efficiency. 4,398,506, Cl. 123-25.00L.
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Robinson, Frank; and Whatmough, Nigel S., 4,398,402, Cl. 66-176.000.
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Cowen, Steven J., to United States of America, Navy. Fiber optic system for transmission of video signals by pulse-frequency-modulation. 4,399,564, Cl. 455-608.000.
Crabb, Elmer R.; and Hoyle, Nick D., to Caterpillar Tractor Co. Rear axle-drawbar oscillation support system. 4,398,617, Cl. 180-235.000.
Crais, Thomas F. Multiple outlet microarterial bridge for digital replantation. 4,398,907, Cl. 604-8.000.
Crandall, Norma M.; Doyle, Raymond H.; and Kunkler, Walter F., to Bendix Corporation, The. Guard for a trigger switch. 4,399,340, Cl. 200-334.000.
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Bosch, Erhard; Craubner, Ingo; Dorsch, Norman; Schiller, August; and Sommer, Oswin, 4,399,267, Cl. 528-30.000.
Crawford, Steven C.; Feltman, Thomas J.; and Steuck, Roger A., to FMC Corporation. Freefall winch system and method of operation. 4,398,698, Cl. 254-291.000.
Crivello, James V.; and Lee, Julia L., to General Electric Company. Method for making diaryliodonium salts. 4,399,071, Cl. 260-440.000.
Cronin, Dennis C., to Beloit Corporation. Extended nip press. 4,398,997, Cl. 162-274.000.
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CTS Corporation: *See*—
Greve, James E., 4,399,336, Cl. 200-11.00R.
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Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., to Ivac Corporation. Pressure diaphragm. 4,398,542, Cl. 128-675.000.
Cunningham, John J., to Petrocon Corporation. Method of employing process oils from converted wastes in synthetic rubbers. 4,399,252, Cl. 524-484.000.
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Curran, William V.; and Ross, Adma S., to American Cyanamid Company. 7-Beta-[alpha-syn-methoxyimino-alpha-(2-aminothiazol-4-yl)-acetamido]-3-[(1,2,3-thiadiazol-5-ylthio)methyl]-3-cephem-4-carboxylic acid and C_1–C_6 alkyl derivatives thereof. 4,399,132, Cl. 424-246.000.
Custer, Dennis R., to Jacobs Manufacturing Company, The. Timing mechanism for engine brake. 4,398,510, Cl. 123-90.160.
Cutts, Edmund A., to Cascut Corporation. Structural element, in particular a boat hull, and method of making the same. 4,398,490, Cl. 114-358.000.
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Czelusniak, Paul A., Jr., to Fieldcrest Mills, Inc. Tufting machine with shiftable and indexing needle bars and method of tufting. 4,398,479, Cl. 112-79.00R.
Daikyo Oil Company Ltd.: *See*—
Fukui, Yukimasa; Mukaida, Heihachiro; and Inden, Masato, 4,399,024, Cl. 208-131.000.
Daimler-Benz Aktiengesellschaft: *See*—
Schoppel, Roman; Fischer, Wolfgang; and Harloff, Bernd, 4,398,744, Cl. 280-504.000.
Dalgoutte, David G.; Archer, John D.; Burke, Peter F. C.; and Pragnell, Robert G., to International Standard Electric Corporation. Optical fibre termination. 4,398,796, Cl. 350-96.200.
Daloisio, Pasquale C., to Pennsylvania Pacific Corporation. Portable storage and dispenser plastic hopper with plastic base. 4,398,653, Cl. 222-185.000.
Daly, Paddy G.: *See*—
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D'Amico, John J., to Monsanto Company. N-Amides of 2-benzothiazolinone. 4,398,940, Cl. 71-90.000.
Damratowski, Harold E., to Triad Corporation. Irrigation pipe gate. 4,398,694, Cl. 251-145.000.
Dan, Petre F., to AMF Incorporated. Sealing assembly for a geophysical cable connector. 4,398,781, Cl. 339-94.00M.
Daniel, Ronald L. S. Loudspeaker cabinet. 4,398,619, Cl. 181-156.000.
Daniels, Phillip D., to Novi Plastics Company. Safety towel bar for wall panels. 4,398,639, Cl. 211-105.100.
Danielson, Richard D.; and Prokop, Robert A., to Minnesota Mining and Manufacturing Company. Tagging with microcapsules containing perfluoroalkyl pentafluorosulfide. 4,399,226, Cl. 436-56.000.
Darling, Stephen D.; Jendrisak, Aloysius A.; and Bokmiller, David J., to Tacoma Products, Inc. Molecular model for chemistry. 4,398,888, Cl. 434-278.000.
Das, Suryya K.; and Kania, Charles M., to PPG Industries, Inc. Cationic latices useful for thermoplastic and thermosetting applications. 4,399,254, Cl. 524-745.000.
D'Asaro, Lucian A.: *See*—
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Data General Corporaton: *See*—
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Datapoint Corporation: *See*—
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Davidson, Jeffrey; Babish, John G.; and Wedig, John H., to Olin Corporation. Use of metallic salts of pyridine-2-thione-N-oxide to treat or prevent swine exudative epidermitis. 4,399,130, Cl. 424-245.000.
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Dawson, C. Bruce: *See*—
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Dawson, John M.: *See*—
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DCA Design Consultants Limited: *See*—
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Dearborn Chemical Company: *See*—
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DeCosmo, Anthony, to American Technical Industries, Inc. Artificial tree construction. 4,399,172, Cl. 428-8.000.
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Degussa Aktiengesellschaft: *See*—
Kleemann, Axel; Fahnenstich, Rudolf; and Samson, Marc, 4,399,302, Cl. 560-266.000.
de Haan, Friedrich J., administrator: *See*—
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Delta Central Refining, Inc.: *See*—
Fletcher, Laird C.; and O'Blasny, Richard H., 4,399,025, Cl. 208-180.000.
Demange, Jean-Pierre; and Lagarde, Pierre, to La Telephonie Industrielle et Commerciale. Method and apparatus for coding and decoding binary data. 4,399,530, Cl. 370-31.000.
Deming, Loretta M.; and Kunz, Raymond W., to Clairol Inc. Electrically heated facial sauna appliance. 4,399,349, Cl. 219-276.000.
Denzin, Horst; Von Inten, Wolfgang; and Pach, Horst, to Francotyp Gesellschaft mbH. Adjustment device for postage metering and value stamping machines. 4,398,458, Cl. 101-91.000.
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, to Klein, Schanzlin & Becker AG. Centrifugal pump casing. 4,398,867, Cl. 415-219.00C.
Desai, Bipinchandra N.: *See*—
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DeSantis, Charles M.; and True, Robert M., to United States of America, Army. Active transmitting antenna employing an electron beam bombarded semiconductor. 4,399,442, Cl. 343-100.0SA.
de Sousa, Bernardo; Muntwyler, Rene; and Schmid, Werner, to Ciba-Geigy Corporation. 5-Phenylcarbamoylbarbituric acid compounds. 4,399,280, Cl. 544-301.000.
DeTora, Sigismondo A.: *See*—
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Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Automatic adaptive selection of accompaniment tone controls for an electronic musical instrument. 4,398,442, Cl. 84-1.170.
DeVan, Jackson H.; and Selle, James E. Method for inhibiting alkali metal corrosion of nickel-containing alloys. 4,398,967, Cl. 148-6.110.
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De Wijn, Jacques A. Cart, undercarriage with foldable wheels. 4,398,736, Cl. 280-40.000.
Dexheimer, Edward M.: *See*—
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Diachem, Inc.: *See*—
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Diamond Shamrock Corporation: *See*—
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Dietrich, David E. Swirl mixing device. 4,398,827, Cl. 366-107.000.
Dietz, Wolfgang, to U.S. Philips Corporation. Binocular viewing device. 4,398,788, Cl. 350-550.000.
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Dijkstra, Rinse: *See*—
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Dion, Donald F.; and Cantella, Michael J., to RCA Corporation. Quantized video signal level interpolator. 4,399,411, Cl. 328-56.000.
Disctron, Inc.: *See*—
Edwards, Roy J., 4,399,480, Cl. 360-132.000.
Diskowski, Herbert; Krause, Johannes; and Mandelkow, Dietrich, to Hoechst Aktiengesellschaft. Process for working up waste water containing phosphorus. 4,399,037, Cl. 210-721.000.
Dixit, Sunit S.; and Thomas, Daniel C., to Richardson Graphics Company. Cleaner and scratch remover composition. 4,399,243, Cl. 524-55.000.
Diziere, Bernard. Device for detachably securing a centerboard to a sailboard or the like. 4,398,485, Cl. 114-132.000.
Dobrovolny, Pierre, to Zenith Radio Corporation. Line isolation and interference shielding for a shielded conductor system. 4,399,419, Cl. 333-12.000.
Dobrynin, Vladimir E.: *See*—
Garkusha, Anatoly V.; and Dobrynin, Vladimir E., 4,398,865, Cl. 415-148.000.
Dr. Johannes Heidenhain GmbH: *See*—
Burkhardt, Horst; and Kober, Hans-Rudolf, 4,399,358, Cl. 250-237.00G.
Doliwa, Heinz-Ulrich, to Werner Kesal Giessereibedarf GmbH. Method of homogenizing cast iron melts and compacts for the carrying out thereof. 4,398,946, Cl. 75-30.000.
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, to Nitrokemia Ipartelepek; Nehezvegyipari Kutato Intezet; and Mta Mezogazdasagi Kutato Intezet. Process for the preparation of 2,6-dialkyl-N-alkoxymethyl-2-chloro-acetanilides. 4,399,306, Cl. 564-214.000.
Domtar Industries Inc.: *See*—
Gonnason, Walter L., 4,398,673, Cl. 241-5.000.
Dorf, Arthur L.; and Lovalenti, Sam, to Owens-Illinois, Inc. Method and apparatus for inspecting glass containers. 4,399,357, Cl. 250-223.00B.
Dorsch, Norman: *See*—
Bosch, Erhard; Craubner, Ingo; Dorsch, Norman; Schiller, August; and Sommer, Oswin, 4,399,267, Cl. 528-30.000.
Doraey, Glenn F., to Litton Systems, Inc. Single channel optical slip ring. 4,398,791, Cl. 350-96.180.
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Shutt, Sidney G.; Dorsman, Adrian K.; and Wilcox, Doyle E., 4,398,418, Cl. 73-517.00B.
Doshi, Kishore J., to Union Carbide Corporation. Enhanced hydrogen recovery from low purity gas streams. 4,398,926, Cl. 55-16.000.
Douglas, Norman F., to Sparton Corporation. Addressable transducer with a variable frequency oscillation for monitoring a physical quantity. 4,399,440, Cl. 340-870.260.
Dove, Norman F. Steam distribution apparatus. 4,398,355, Cl. 34-54.000.
Dow Chemical Company, The: *See*—
McClure, John C., 4,399,288, Cl. 548-239.000.
Raley, Charles F., Jr.; and Husser, Edward R., 4,399,235, Cl. 521-31.000.
Shipley, Randall S.; Birkelbach, Donald F.; and Lowery, Kirby, Jr., 4,399,053, Cl. 252-429.00B.
Shipley, Randall S., 4,399,056, Cl. 252-431.00C.
Wilson, David A., 4,399,070, Cl. 260-429.900.
Downing, Terry R.; and Geiersbach, Allois F., to Allis-Chalmers Corporation. Fork lift truck having means to test overload protective system. 4,398,860, Cl. 414-634.000.
Doyle, Raymond H.: *See*—
Crandall, Norma M.; Doyle, Raymond H.; and Kunkler, Walter F., 4,399,340, Cl. 200-334.000.
Drake, Eric F., to Reed Rock Bit Company. Methods of manufacturing gradient composite metallic structures. 4,398,952, Cl. 419-18.000.
Dremann, George H. Hydraulically actuated jam release system for a jaw type crushing apparatus. 4,398,674, Cl. 241-30.000.
Dresser Industries, Inc.: *See*—
Braden, Donald G.; and Riehl, David C., 4,398,616, Cl. 180-140.000.
Fertl, Walter H.; Frost, Elton; and Oliver, Donald W., 4,399,359, Cl. 250-270.000.
Kirkham, Steven C.; and Schantz, Ronald K., 4,398,869, Cl. 417-216.000.
Klimowicz, Richard F., 4,398,641, Cl. 213-109.000.
Phillips, James D., 4,399,546, Cl. 373-115.000.
Schroeder, William L., 4,398,862, Cl. 414-723.000.
Drieer, Joseph R.; and Kovach, Jonathan W., to Kelley Company, Inc. Yieldable and releasable lip lifting mechanism for a dockboard. 4,398,315, Cl. 14-71.300.

Druffel, James B., to Prescolite. Retainer for a lamp. 4,399,497, Cl. 362-362.000.

Druke, Michael B.; Feaver, Richard L.; and Kosior, Stefan, to Data General Corporaton. External microcode operation in a multi-level microprocessor. 4,399,505, Cl. 364-200.000.

Dual-Lite, Inc.: *See*—
Ziff, Stephen J.; Sieron, Richard L.; and Shine, William P., 4,399,371, Cl. 307-147.000.

Duff, David, to Hoover Universal, Inc. Sofa bed overdeck assembly. 4,398,312, Cl. 5-13.000.

Duffy, Eugene P. Tool for severing thermoplastic electrical cable sheath. 4,398,347, Cl. 30-90.100.

Dugge, Richard H., to ACF Industries, Incorporated. Combination vacuum relief valve and pressure relief valve. 4,398,557, Cl. 137-493.900.

Duncan, Jeffrey B.: *See*—
Bolton, Joseph A.; and Duncan, Jeffrey B., 4,398,996, Cl. 162-198.000.

Duphar International B.V.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,399,152, Cl. 424-322.000.

Du Pont de Nemours, E. I., and Company: *See*—
Brodoway, Nicolas, 4,399,263, Cl. 525-382.000.
Frazer, August H., 4,399,270, Cl. 528-125.000.
Glass, Gary L., 4,399,060, Cl. 252-511.000.
Hyde, Thomas J., 4,399,246, Cl. 524-169.000.
Koppen, Johannes E. A.; and Workman, Samuel E., 4,398,676, Cl. 242-18.00A.
Levitt, George, 4,398,939, Cl. 71-90.000.
Milford, George N., Jr., 4,399,303, Cl. 562-437.000.
Milford, George N., Jr., 4,399,303, Cl. 562-437.000.
Morrison, William H., Jr., 4,399,237, Cl. 521-62.000.
Romanauskas, William A., 4,398,905, Cl. 494-16.000.
Scribner, Richard M., 4,399,290, Cl. 548-534.000.
Squire, Edward N., 4,399,264, Cl. 526-247.000.
Tocker, Stanley, 4,399,122, Cl. 424-21.000.
Withers, Michael S., 4,399,183, Cl. 428-247.000.

DuPont, Paul R.; and Nelson, Craig R. On-site fabricating of plastic pipe fittings. 4,398,879, Cl. 425-392.000.

Durable Packaging Corporation: *See*—
Ulrich, Lawrence W.; and Walker, Connie W., 4,398,381, Cl. 53-393.000.

Duranleau, Roger G., to Texaco Inc. Process for preparing low molecular weight oxygenated compounds from syngas using novel catalyst system. 4,399,233, Cl. 518-701.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,399,142, Cl. 424-258.000.

Durckheimer, Walter; Ehlers, Eberhard; Seliger, Hubert; and Schrinner, Elmar, to Hoechst AG. Cephem derivatives. 4,399,131, Cl. 424-246.000.

Duret, Jean; Soulier, Charles; and Trouillet, Georges, to Vallourec, S. A. Cylindro-conical pipe joint. 4,398,756, Cl. 285-334.000.

Duvignacq, Maurice-Claude, to Baby Relax. Inclinable support, particularly for child's carriage. 4,398,748, Cl. 280-644.000.

Dymax Corporation: *See*—
Matzuk, Terrance, 4,398,425, Cl. 73-633.000.

Dynamics Research Corporation: *See*—
Bakewell, Joseph J., 4,399,348, Cl. 219-216.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenhain, Hermann, 4,399,300, Cl. 560-204.000.

Eagon, Bevery M., to Kimberly-Clark Corporation. Releasable, self-detackifying laminate construction. 4,398,985, Cl. 156-233.000.

Earnshaw, Christopher G.: *See*—
Baillie, Alister C.; Wright, Brian J.; Wright, Kenneth; and Earnshaw, Christopher G., 4,399,287, Cl. 548-119.000.

Eastman Kodak Company: *See*—
French, William W.; Lemke, James U.; and McClure, Richard J., 4,398,345, Cl. 29-603.000.
Kron, Martin W.; and Polz, Victor I., 4,398,678, Cl. 242-56.300.
Meckel, Benjamin B., 4,399,479, Cl. 360-126.000.
Powell, Philip G., 4,399,461, Cl. 358-166.000.
Smith, Robert C., Jr.; and McGlen, James A., 4,398,986, Cl. 156-290.000.
Wey, Jong-Shinn, 4,399,215, Cl. 430-567.000.
Witerski, Peter C.; and Pierson, Charles W., 4,398,982, Cl. 156-157.000.

Eastman, Lester F.: *See*—
Stall, Richard A.; Wood, Colin E. C.; and Eastman, Lester F., 4,398,963, Cl. 148-1.500.

Ebauches S.A.: *See*—
Fatton, Jean-Claude; Calame, Jean-Pierre; and Mutrux, Claude, 4,398,831, Cl. 368-76.000.

Ebeling, Wilfried: *See*—
Coblenz, Rolf; Schulte, Klaus; Ebeling, Wilfried; and Evertz, Dieter, 4,399,104, Cl. 422-111.000.

Edelson, Richard L., to Bourke, Frederic A., Jr.; Bourke, Eleanor F.; Edelson, Richard L.; and Edelson Trust, The. Method for externally treating the blood. 4,398,906, Cl. 604-6.000.

Edelson Trust, The: *See*—
Edelson, Richard L., 4,398,906, Cl. 604-6.000.

Edwards, Roy J., to Disctron, Inc. Head access door, opening mechanism and method of sealing. 4,399,480, Cl. 360-132.000.

Ehlers, Eberhard: *See*—
Durckheimer, Walter; Ehlers, Eberhard; Seliger, Hubert; and Schrinner, Elmar, 4,399,131, Cl. 424-246.000.

Eidenschink, Rudolf: *See*—
Pohl, Ludwig; Eidenschink, Rudolf; del Pino, Fernando; and Weber, Georg, 4,398,803, Cl. 350-334.000.

Eisenmann, Siegfried. Gear ring pump. 4,398,874, Cl. 418-171.000.

Eisenstein, Stephen E.; and Dexheimer, Edward M., to BASF Wyandotte Corporation. Comfort additive for acrylic fibers. 4,399,091, Cl. 264-182.000.

Eisner, Philip N.: *See*—
Lyon, Richard K.; Eisner, Philip N.; and Thomas, William R. I., 4,399,010, Cl. 204-157.10R.

El Chahawi, Moustafa: *See*—
Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenhain, Hermann, 4,399,300, Cl. 560-204.000.

Elderfield, Raymond N., to Carblox Limited. Tuyeres with heat pipes and method of manufacturing. 4,398,703, Cl. 266-270.000.

Eldred, Donald, to General Electric Company. Pumping and metering device for fluid metals using electromagnetic pump. 4,398,589, Cl. 164-337.000.

Electricite de France (Service National): *See*—
Amouroux, Jacques; and Morvan, Daniel, 4,399,116, Cl. 423-348.000.

Electro Switch Corp.: *See*—
MacLean, Alexander, 4,399,421, Cl. 335-174.000.

Eli Lilly and Company: *See*—
Debono, Manuel, 4,399,067, Cl. 260-112.50R.

Elia, Raymond Z. A.: *See*—
Gewitz, Steven; and Elia, Raymond Z. A., 4,399,333, Cl. 179-175.30F.

Elleman, Daniel D.: *See*—
Trinh, Eugene H.; Elleman, Daniel D.; and Wang, Taylor G., 4,398,925, Cl. 55-15.000.

Ellis, Charles R. Exercising device. 4,398,713, Cl. 272-145.000.

Ellis, Raymond J., to Olga Company. Brassiere pad fabrication. 4,398,981, Cl. 156-91.000.

Emery Industries, Inc.: *See*—
Hinze, Adrien G.; Roggeveen, Robert P.; and Meulenberg, Abraham J., 4,399,258, Cl. 525-184.000.

EMI Limited: *See*—
Hounsfield Godfrey N., 4,399,509, Cl. 364-414.000.

Emi, Shingo: *See*—
Sagawa, Yasuhiko; Norota, Susumu; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,399,084, Cl. 264-27.000.

Emmerich, Wolfgang, to Atlas Copco Aktiebolag. Vibration damped rivet bucking tool. 4,398,411, Cl. 72-482.000.

Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,399,142, Cl. 424-258.000.

Emoto, Kanji; Onishi, Masayuki; Yamada, Hirosuke; Hirayama, Katsuhisa; Ohzu, Hideshi; Ogawa, Masakatsu; and Masuda, Yasuo, to Kawasaki Steel Corporation. Methods for controlling blowing, controlling the slag formation and predicting slopping in the blowing of molten pig iron in LD converter. 4,398,948, Cl. 75-60.000.

Endo, Hozumi: *See*—
Tosaka, Susumu; Abe, Tadamichi; Endo, Hozumi; and Ogawa, Kiyohiro, 4,399,113, Cl. 423-240.000.

Endo, Tetsuhiko; Ueda, Kunihiko; and Kohara, Tadashi, to Toray Industries, Inc. Process and apparatus for simultaneously drawing and false-twisting thermoplastic synthetic yarn. 4,398,386, Cl. 57-288.000.

Endo, Yoshihiro; Yamashita, Yoshito; Kishishita, Hiroshi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Method for fabricating an indium tin oxide film for a transparent electrode. 4,399,015, Cl. 204-192.00P.

Energy Development Associates, Inc.: *See*—
Galloway, James H., 4,399,200, Cl. 429-23.000.

Energy Fibers Int'l. Corp.: *See*—
Monaghan, George J., 4,399,544, Cl. 373-35.000.

Engelke, Heinz: *See*—
Grube, Gerhard; and Engelke, Heinz, 4,399,367, Cl. 250-560.000.

Englar, Robert J.: *See*—
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,398,687, Cl. 244-207.000.

Engle, Frank W. Plasma reactor and method therefor. 4,399,014, Cl. 204-192.00E.

English, Edgar, Jr. Solar energy conversion apparatus provided with an automatic cut-in heat-supplying standby apparatus. 4,398,391, Cl. 60-641.150.

Epstein, Harry. Workpiece mounting device for cutting a circle. 4,398,440, Cl. 83-439.000.

Equipment Development Company: *See*—
Harding, Edward M., 4,398,737, Cl. 280-47.13R.

Erbes, Kurt: *See*—
Herwig, Walter; Erbes, Kurt; Decker, Rudolf; and Sikora, Helga, 4,399,239, Cl. 521-137.000.

Erickson, Erick E.; Oberth, Christian H.; Breslow, Jeffrey D.; and Montague, Douglas P., to Marvin Glass & Associates. Viewing device for generating a three-dimensional image. 4,398,723, Cl. 273-313.000.

Erickson, Robert A., to Kennametal Inc. Insert holder and method of holding. 4,398,853, Cl. 407-104.000.

Erpenbach, Markus: *See*—
Maurer, Alexander; Heymer, Gero; and Erpenbach, Markus, 4,399,114, Cl. 423-321.00R.

Erwin, Kenneth L., Jr.: *See*—
Tilgner, Peter; Wingard, Robert D.; Leida, Shirley M.; and Erwin, Kenneth L., Jr., 4,399,105, Cl. 422-111.000.

Eschem Inc.: *See*—
Bildusas, Leon L., 4,399,249, Cl. 524-271.000.

Eschenfelder, Peter: *See*—
Hahn, Michael; Wackerle, Peter; Eschenfelder, Peter; and Schulz, Ralf-Thilo, 4,398,693, Cl. 249-155.000.

Esmil BV: *See*—
Klaren, Dick G., 4,398,594, Cl. 165-104.160.

Espelage, Paul M., to General Electric Company. Line-to-line voltage reconstruction for synchronizing thyristor power converter. 4,399,395, Cl. 318-803.000.

Essex Group, Inc.: *See*—
Hedrick, Paul A., 4,398,785, Cl. 339-196.00R.

Estel Hoogovens BV: *See*—
van Laar, Jacobus; Vander, Timen; Kroes, Johannes A.; and Brorsen, Pieter G., 4,398,999, Cl. 202-267.00R.

Ethyl Corporation: *See*—
Rifkin, Ellis B.; Gluckstein, Martin E.; and Perilstein, Warren L., 4,398,921, Cl. 44-56.000.

Eue, Ludwig: *See*—
Forster, Heinz; Hofer, Wolfgang; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,399,285, Cl. 546-210.000.

Evans, Ben E.: *See*—
Anderson, Paul; Christy, Marcia E.; and Evans, Ben E., 4,399,141, Cl. 424-256.000.

Evans, Brian L.; and Woodcock, Robert R., to Beam, D. Solid state skate truck. 4,398,735, Cl. 280-11.280.

Evans, Charles W.; Flusche, Frederick O.; Messina, Benedicto U.; Richardson, Ethel L.; Robinson, James R.; and Wetzel, Joseph A., to International Business Machines Corporation. Store-in-cache processor means for clearing main storage. 4,399,506, Cl. 364-200.000.

Evans, Trevor; and Allen, Brian P. Diamond treatment. 4,399,364, Cl. 250-492.100.

Everett, Lynn E., to Tusco, Inc. Boat seat mounting structure. 4,398,766, Cl. 297-252.000.

Evertz, Dieter: *See*—
Coblenz, Rolf; Schulte, Klaus; Ebeling, Wilfried; and Evertz, Dieter, 4,399,104, Cl. 422-111.000.

EVG Entwicklungs u.-Verwertungs Gesellschaft mbH: *See*—
Ritter, Klaus; Gott, Hans; Ritter, Gerhard; and Ritter, Josef, 4,399,342, Cl. 219-58.000.

Ewen, Warren E. Hitch pin assembly. 4,398,322, Cl. 24-201.0LP.

Ex-Cell-O Corporation: *See*—
Wise, Daniel J., 4,398,900, Cl. 493-62.000.

Excelermatic Inc.: *See*—
Kraus, Charles E., 4,398,778, Cl. 308-235.000.

Exxon Production Research Co.: *See*—
Ortloff, John E.; Greer, Matthew N.; and Gardner, Terry N., 4,398,487, Cl. 114-243.000.
Pan, Robert B., 4,398,427, Cl. 73-784.000.

Exxon Research and Engineering Co.: *See*—
Asher, William J.; and Venero, Agustin F., 4,398,927, Cl. 55-34.000.
Lyon, Richard K.; Eisner, Philip N.; and Thomas, William R. I., 4,399,010, Cl. 204-157.10R.
Seiver, Robert L.; and Gernand, Martin O., 4,399,047, Cl. 252-62.550.

Eynck, John J., to United States of America, Navy. Acoustic baffle for high-pressure service, modular design. 4,399,526, Cl. 367-149.000.

F. Vaihinger GmbH & Co. Kommanditgeseilschaft: *See*—
Koerfer, Helmut, 4,398,830, Cl. 366-144.000.

Fabcon, Incorporated: *See*—
Hanson, David W.; Nash, Richard C.; and Koehn, Richard R., 4,398,761, Cl. 294-81.00R.

Fabrygel, Joe H. Break-out tool for annular type blow-out preventers. 4,398,598, Cl. 166-85.000.

Fael SA: *See*—
Muller, Jakob; and Schreiber, Peter, 4,399,343, Cl. 219-64.000.

Fag Kugelfischer Georg Schafer & Co.: *See*—
Hofmann, Heinrich; Markfelder, Gunter; and Troster, Manfred, 4,398,775, Cl. 308-201.000.
Kutemeier, Hans-Dieter, 4,398,776, Cl. 308-207.00R.
Voll, Horst; and Braune, Gerhard, 4,398,774, Cl. 308-184.00R.

Fagerberg, Eric W., to Inlands Aktiebolag. Machine for producing bodies of conical receptacles. 4,398,904, Cl. 493-296.000.

Fahnenstich, Rudolf: *See*—
Kleemann, Axel; Fahnenstich, Rudolf; and Samson, Marc, 4,399,302, Cl. 560-266.000.

Fairchild Camera & Instrument Corporation: *See*—
Lehrer, William I., 4,398,335, Cl. 29-577.00C.
Tickle, Andrew C.; and Vora, Madhukar B., 4,398,338, Cl. 29-571.000.

Fairchild-Weston Systems Inc.: *See*—
Balopole, Harvey L.; and Traynor, Thomas H., 4,399,462, Cl. 358-183.000.

Falck, John B.; and Robson, David, to Tag Radionics Limited. Coded information arrangement. 4,399,437, Cl. 340-825.540.

Fang, Robert C. Y.; and Chiu, Kuang Y., to Hewlett-Packard Company. Defect free zero oxide encroachment process for semiconductor fabrication. 4,398,992, Cl. 156-643.000.

Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. Oxacephalosporins and anti-bacterial composition containing same. 4,399,135, Cl. 424-248.510.

Farkas nee Kirjak, Maria: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.

Fatton, Jean-Claude; Calame, Jean-Pierre; and Mutrux, Claude, to Ebauches S.A. Electronic watch. 4,398,831, Cl. 368-76.000.

Faure, Jean-Paul: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,398,933, Cl. 65-1.000.

Fauve, Robert M., to Institut Pasteur. Peptides having immunostimulating properties and pharmaceutical compositions containing them. 4,399,124, Cl. 424-177.000.

Fayter, Richard G., Jr.; and Hall, Allen L., to National Distillers and Chemical Corporation. 1,1-Disubstituted 2-vinyl- and 2-ethylcyclopropanes. 4,399,076, Cl. 260-465.00F.

FBC Limited: *See*—
Baillie, Alister C.; Wright, Brian J.; Wright, Kenneth; and Earnshaw, Christopher G., 4,399,287, Cl. 548-119.000.

Feaver, Richard L.: *See*—
Druke, Michael B.; Feaver, Richard L.; and Kosior, Stefan, 4,399,505, Cl. 364-200.000.

Federal Cartridge Corporation: *See*—
Young, Steven J.; Semmel, Gary K.; and Munich, Terry L., 4,398,564, Cl. 138-92.000.

Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, to Adaptive Optics Associates, Inc. Optical wavefront sensing system. 4,399,356, Cl. 250-201.000.

Feldman, Martin; White, Alan D.; and White, Donald L., to Bell Telephone Laboratories, Incorporated. Wafer tilt compensation in zone plate alignment system. 4,398,824, Cl. 356-401.000.

Fellrath, Jean: *See*—
Gerber, Bernard; and Fellrath, Jean, 4,399,523, Cl. 365-218.000.

Feltman, Thomas J.: *See*—
Crawford, Steven C.; Feltman, Thomas J.; and Steuck, Roger A., 4,398,698, Cl. 254-291.000.

Fennemann, Wolfgang, to Metallgesellschaft Aktiengesellschaft. Process of recovering anhydrous zirconium tetrafluoride. 4,399,118, Cl. 423-489.000.

Feola, Salvatore. Built-in trailer for boats. 4,398,489, Cl. 114-344.000.

Ferag AG: *See*—
Hansch, Egon, 4,398,710, Cl. 270-55.000.

Fernseh Inc.: *See*—
Warnock, Richard B.; and Brugger, Leonard J., 4,399,454, Cl. 358-16.000.

Ferrara, Louis T. Blood dispenser device. 4,399,103, Cl. 422-100.000.

Ferraris, Mario; Rosati, Francesco; Parodi, Sandro; Giannetti, Enzo; Motroni, Giuseppe; and Albizzati, Enrico, to Montedison S.p.A. Catalyst components and catalysts for the polymerization of alpha-olefins. 4,399,054, Cl. 252-429.00B.

Ferretti, John S.: *See*—
Cathers, William P.; and Ferretti, John S., 4,398,979, Cl. 156-87.000.

Fertl, Walter H.; Frost, Elton; and Oliver, Donald W., to Dresser Industries, Inc. Method for monitoring flood front movement during water flooding of subsurface formations. 4,399,359, Cl. 250-270.000.

Feuerherd, Karl-Heinz: *See*—
Gimpel, Jurgen; Feuerherd, Karl-Heinz; and Schenck, Hans-Uwe, 4,399,256, Cl. 525-111.000.

Fiberlux Products, Inc.: *See*—
Mancuso, Paul, 4,398,373, Cl. 49-425.000.

Fieldcrest Mills, Inc.: *See*—
Czelusniak, Paul A., Jr., 4,398,479, Cl. 112-79.00R.

Fienhold, Stephen C., to Teledyne Industries, Inc. Fluid-spray discharge apparatus. 4,398,669, Cl. 239-447.000.

Fikart, Josef L.: *See*—
Froese, Abram; and Fikart, Josef L., 4,399,408, Cl. 324-78.00Z.

Finlay, Robert L., to BPE, Inc. Bow square head. 4,398,354, Cl. 33-180.00R.

Finucane, Thomas P.: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased, 4,399,158, Cl. 426-112.000.

Fire Out Enterprises Company, Inc.: *See*—
Conklin, Michael T.; and Mowry, Charles F., 4,398,605, Cl. 169-47.000.

Fischer, Wolfgang: *See*—
Schoppel, Roman; Fischer, Wolfgang; and Harloff, Bernd, 4,398,744, Cl. 280-504.000.

Fisher, Alan R., to Ford Motor Company. Multiple ratio transmission having a torque splitter input gear with a pocketed carrier. 4,398,436, Cl. 74-688.000.

Fisher, James R.; and Kulier, Charles P., to Warner Lambert Company. Pharmaceutical salts of 4'-(9-acridinylamino)-methanesulfon-m-anisidide. 4,399,283, Cl. 546-106.000.

Fisher, Paul S.; and McLoughlin, Robert W., to Gallaher Limited. Inspection apparatus. 4,398,546, Cl. 131-88.000.

Fisons Limited: *See*—
Schneider, Michel; Guillot, Christian; and Ayerbe, Andre, 4,399,221, Cl. 435-193.000.

Flanders, Thomas E.: *See*—
Moore, Herbert E.; and Flanders, Thomas E., 4,399,547, Cl. 375-83.000.

Fleenor, Jonathan T.; Long, George W., Jr.; and Dawson, John M., to Trinity Lutheran Hospital. Auxiliary powered drive for roller pump used in cardiopulmonary bypass operations. 4,398,872, Cl. 417-360.000.

Fleischer, Paul E.: *See*—
Ballantyne, James P.; Fleischer, Paul E.; Laker, Kenneth R.; and Yiannoulos, Aristides A., 4,399,417, Cl. 330-109.000.

Fletcher, Laird C.; and O'Blasny, Richard H., to Delta Central Refining, Inc. Solvent extraction process for rerefining used lubricating oil. 4,399,025, Cl. 208-180.000.

Fleury, Georges; and Payen, Francis, to Thomson-CSF. Travelling wave tube with coupled cavities and focusing by alternating permanent magnets and amplifying system comprising such a tube. 4,399,389, Cl. 315-3.500.

Fleury, Guy, to Dicta-Son Inc. Method and system for grading and sorting articles. 4,398,637, Cl. 209-546.000.

Flider, Frank J.; Orthoefer, Frank T.; and Short, Robert G., to A. E. Staley Manufacturing Company. Enzymatically treated phosphatides. 4,399,224, Cl. 435-271.000.

Floyd, Larry K.; and Bodnar, Bert S. Laminar flow connector for blood and sterile solutions. 4,398,757, Cl. 285-315.000.

Flusche, Frederick O.: *See*—
Evans, Charles W.; Flusche, Frederick O.; Messina, Benedicto U.; Richardson, Ethel L.; Robinson, James R.; and Wetzel, Joseph A., 4,399,506, Cl. 364-200.000.

FMC Corporation: *See*—
Crawford, Steven C.; Feltman, Thomas J.; and Steuck, Roger A., 4,398,698, Cl. 254-291.000.
Harris, Robert M.; and Betzold, Edward R., 4,398,447, Cl. 89-46.000.

Fokker B.V.: *See*—
Lam, Wilhelmus J.; and de Vries, Luitzen, 4,398,889, Cl. 434-45.000.

Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Lewis acid halide catalysts for preparation of polyamines. 4,399,308, Cl. 564-479.000.

Ford Motor Company: *See*—
Ahrns, Daniel C.; and Rachedi, Shane H., 4,398,525, Cl. 123-568.000.
Fisher, Alan R., 4,398,436, Cl. 74-688.000.
Rachedi, Shane H., 4,398,524, Cl. 123-568.000.
Rhodes, Eugene E., 4,398,332, Cl. 29-157.30R.

Forrest, David, to Singer Company, The. Stitch length stops for industrial sewing machine. 4,398,482, Cl. 112-316.000.

Forrester, Howard M., to United States of America, Navy. Laser modulator. 4,399,418, Cl. 332-7.510.

Forster, Heinz; Hofer, Wolfgang; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Tetrazolyloxyacetic acid amides, piperidides and perhydro azepinides. 4,399,285, Cl. 546-210.000.

Forsythe, Curtis J., to Top-Scor Products, Inc. Shortening replacing and fresh slice improving agents for yeast-raised bakery products. 4,399,155, Cl. 426-24.000.

Fosdick, Dale P.: *See*—
Rosaen, Borje O.; and Fosdick, Dale P., 4,399,033, Cl. 210-236.000.

Foster Wheeler Energy Corporation: *See*—
Kunsagi, Laszlo, 4,398,928, Cl. 55-107.000.

Fostini, Raymond V.: *See*—
Gupta, Indra; Fostini, Raymond V.; and Moss, Timothy E., 4,398,950, Cl. 75-124.000.

Fotino, Mircea, to University Patents, Inc. Transmission electron microscope employing sequential pixel acquistion for display. 4,399,360, Cl. 250-311.000.

Fowler, Hubert H.; and Hunter, Joe M., to Celanese Corporation. Aqueous epoxy-urethane dispersions. 4,399,242, Cl. 523-404.000.

Fraioli, Donato M., to Air-Tech Industries, Inc. Fabric panel unit. 4,398,376, Cl. 52-2.000.

Francotyp Gesellschaft mbH: *See*—
Denzin, Horst; Von Inten, Wolfgang; and Pach, Horst, 4,398,458, Cl. 101-91.000.

Frank, Marshall E.: *See*—
Sherwin, Martin B.; and Frank, Marshall E., 4,399,295, Cl. 549-518.000.

Franke, Hans-Joachim: *See*—
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,398,867, Cl. 415-219.00C.

Franssen, Nico V., deceased; and by de Haan, Friedrich J., administrator, to U.S. Philips Corporation. Direction and frequency independent column of electro-acoustic transducers. 4,399,328, Cl. 179-1.0GA.

Franz Barta Kommanditgesellschaft: *See*—
Barta, Franz, 4,399,178, Cl. 428-202.000.

Frase, Roland J.; and Robinson, Edward L., Jr., to International Harvester Co. Seed planter apparatus with covering wheel. 4,398,478, Cl. 111-85.000.

Frazer, August H., to Du Pont de Nemours, E. I., and Company. Fiber-forming polyesters of ketodiols. 4,399,270, Cl. 528-125.000.

Freiser, Henry; and Martin, Charles R., to University Patents, Inc. Large organic cation-selective electrodes. 4,399,002, Cl. 204-1.00T.

Fremerey, Johan K.: *See*—
Boden, Karl; and Fremerey, Johan K., 4,398,773, Cl. 308-10.000.

French, Edward C.: *See*—
Bakker, John A.; and French, Edward C., 4,398,324, Cl. 24-230.00R.

French, Errol J. Frame connection assembly for a fence gate. 4,398,840, Cl. 403-98.000.

French, William W.; Lemke, James U.; and McClure, Richard J., to Eastman Kodak Company. Method of making a multitrack magnetic head employing double helix structure. 4,398,345, Cl. 29-603.000.

Frenchu, William R.: *See*—
Zanzucchi, Peter J.; and Frenchu, William R., 4,399,361, Cl. 250-343.000.

Frey, Alexander H., Jr.: *See*—
Cosgrove, Michael R., deceased; Frey, Alexander H., Jr.; Moore, Kenneth A.; Peled, Abraham; Ris, Frederic N.; and Sproul, William W., III, 4,399,507, Cl. 364-200.000.

Friderichs, Elmar: *See*—
Graudums, Ivars; and Friderichs, Elmar, 4,399,145, Cl. 424-267.000.

Fridl, James J.; Nonnemann, Heinz W.; Payne, Robert D.; and Szpitalak, Wesley J., to Continental Group, Inc., The. Acoustic indicator of vacuum level in containers. 4,398,491, Cl. 116-67.00R.

Friedrich, Ludwig: *See*—
Steiner, Gerd; Friedrich, Ludwig; and Lenke, Dieter, 4,399,139, Cl. 424-250.000.

Fritts, David H.; and Leonard, John F., to United States of America, Air Force. Method of nickel electrode production. 4,399,005, Cl. 204-2.100.

Froese, Abram; and Fikart, Josef L., to Ael Microtel, Ltd. Apparatus for testing the linearity of a frequency modulated oscillator. 4,399,408, Cl. 324-78.00Z.

Frohlich, Alfons, to Opti Patent-, Forschungs- und Fabrikations-AG. Slide fastener stringer and method of making same. 4,398,571, Cl. 139-384.00B.

Froling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., to Lever Brothers Company. Hydrogenation. 4,399,007, Cl. 204-59.00R.

Fromm AG: *See*—
Fromm, Peter, 4,398,572, Cl. 140-93.200.

Fromm, Peter, to Fromm AG. Hooper mechanism for connecting steel bands. 4,398,572, Cl. 140-93.200.

Frost, Elton: *See*—
Fertl, Walter H.; Frost, Elton; and Oliver, Donald W., 4,399,359, Cl. 250-270.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kubota, Masaharu; and Kurihara, Toshiro, 4,398,517, Cl. 123-440.000.

Fuji Pack System Ltd.: *See*—
Takamura, Yoshiyuki, 4,398,380, Cl. 53-390.000.

Fuji Photo Film Co., Ltd.: *See*—
Kondo, Syunichi; Matsufuji, Akihiro; Umehara, Akira; Ukai, Toshinao; and Sato, Akira, 4,399,211, Cl. 430-269.000.
Nagano, Teruo; and Nagashima, Akira, 4,399,210, Cl. 430-175.000.

Fuji Xerox Co., Ltd.: *See*—
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,399,444, Cl. 346-76.0PH.

Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Compact zoom lens of high magnification. 4,398,808, Cl. 350-427.000.

Fujii, Noritsugu: *See*—
Tanaka, Yoshiro; Fujii, Noritsugu; Akagi, Kazuo; and Shitamatsu, Ryujiro, 4,398,552, Cl. 134-57.00R.

Fujiki, Takuya: *See*—
Yoshida, Zenichi; Kato, Susumu; Fujiki, Takuya; and Amemiya, Yasuhiro, 4,399,075, Cl. 260-465.00F.

Fujimoto, Hideaki: *See*—
Kitamura. Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; and Fujimoto, Hideaki, 4,398,949, Cl. 75-60.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Nakaguchi, Osamu; Okada, Satoshi; and Hashimoto, Masashi, 4,399,066, Cl. 260-112.50R.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,399,133, Cl. 424-246.000.
Takaya, Takao; and Chiba, Toshiyuki, 4,399,277, Cl. 544-016.000.
Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, 4,399,278, Cl. 544-022.000.

Fujita, Masaaki: *See*—
Kawashima, Kazumi; and Fujita, Masaaki, 4,399,463, Cl. 358-191.100.

Fujita, Takashi: *See*—
Matsuura, Mitsuyuki; and Fujita, Takashi, 4,399,055, Cl. 252-429.00B.

Fujitani, Shigeo; and Matsuda, Youichi, to Union Carbide Corporation. Process and apparatus for forming a plastic film. 4,399,094, Cl. 264-566.000.

Fujitsu Limited: *See*—
Nakajima, Junzo; Kimura, Masatoshi; and Matsuda, Tadashi, 4,398,816, Cl. 355-3.00R.
Shirai, Kazunari, 4,399,451, Cl. 357-59.000.

Fukada, Yasuo: *See*—
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,398,876, Cl. 425-143.000.

Fukatsu, Yoshiaki: *See*—
Hattori, Katsuhide; Fukatsu, Yoshiaki; and Torii, Akio, 4,398,976, Cl. 149-21.000.

Fukuda, Masahito; Tanabe, Akiyoshi; Moriguchi, Yasuo; Nagai, Nobuyuki; Tsuji, Kunio; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Mizuta, Atsuo, to Kabushiki Kaisha Kobe Seiko Sho. Method for producing cold rolled titanium strips. 4,398,406, Cl. 72-42.000.

Fukui, Yukimasa; Mukaida, Heihachiro; and Inden, Masato, to Daikyo Oil Company Ltd. Method for treating petroleum heavy oil. 4,399,024, Cl. 208-131.000.

Fukunaga, Ichiro: *See*—
Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, 4,398,699, Cl. 266-50.000.

Fukunaga, Yasuo: *See*—
Ohta, Yukitake; Fukunaga, Yasuo; and Masubuchi, Hitoshi, 4,398,793, Cl. 350-96.200.
Fuller, Charles C.; and Hendrickson, James L., to Safe-Base, Inc. Ball base construction and anchor. 4,398,714, Cl. 273-25.000.
Furey, Roger J.: *See*—
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,398,687, Cl. 244-207.000.
Furlan, Antonio; Thiella, Francesco; and Tibaldo, Flavio, to SIP - Societa Italiana per L'Esercizio Telefonico p.a. Programmable traffic-measuring unit for telecommunication system. 4,399,332, Cl. 179-8.00A.
Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,399,261, Cl. 525-342.000.
Furuno Electric Co., Ltd.: *See*—
Sato, Yuji; and Koizumi, Shoji, 4,399,445, Cl. 346-136.000.
Furuta, Kenzi: *See*—
Satoh, Ken; and Furuta, Kenzi, 4,399,355, Cl. 377-18.000.
Fushiki, Yasuo: *See*—
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,398,987, Cl. 156-324.000.
G.D. Searle & Co.: *See*—
Chorvat, Robert J.; Desai, Bipinchandra N.; and Radak, Suzanne E., 4,399,279, Cl. 544-51.000.
G.D. Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,398,438, Cl. 83-310.000.
Gacek, Mikkel; and Undheim, Kjell, to Nyegaard & Co. A/S. 5-Halopyrimidin-2-ones, the salts thereof. 4,399,140, Cl. 424-251.000.
Gaidis, James M.: *See*—
Rosenberg, Arnold M.; Gaidis, James M.; and Troffkin, Howard J., 4,398,959, Cl. 106-90.000.
Gaiser, Robert F., to Bendix Corporation, The. Master cylinder with fast fill auxiliary chamber within a piston. 4,398,390, Cl. 60-562.000.
Gallagher, Patrick K.; and Robbins, Murray, to Bell Telephone Laboratories, Incorporated. Preparation of III-V materials by reduction. 4,399,097, Cl. 420-555.000.
Gallaher Limited: *See*—
Fisher, Paul S.; and McLoughlin, Robert W., 4,398,546, Cl. 131-88.000.
Galloway, James H., to Energy Development Associates, Inc. Device for controlling a pump in a storage battery. 4,399,200, Cl. 429-23.000.
Gamble, Clarence M.; and Stone, Frank, Jr. Protector for muzzle loading rifle. 4,398,367, Cl. 42-1.00N.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,399,142, Cl. 424-258.000.
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., to Colgate-Palmolive Company. High bulk density particulate heavy duty laundry detergent. 4,399,048, Cl. 252-91.000.
Ganic, Ejup N., to University of Illinois Foundation. System for separation of water from the working fluid in low temperature difference power plants. 4,398,392, Cl. 60-657.000.
Gardner, Terry N.: *See*—
Ortloff, John E.; Greer, Matthew N.; and Gardner, Terry N., 4,398,487, Cl. 114-243.000.
Garkusha, Anatoly V.; and Dobrynin, Vladimir E. Exhaust pipe of turbine. 4,398,865, Cl. 415-148.000.
Garti, Nissim: *See*—
Sarig, Sara; Garti, Nissim; and Tibika, Francoise, 4,399,003, Cl. 204-1.00T.
Garware Plastics & Polyester Ltd.: *See*—
Garware, Shashikant B.; and Ananthanarayanan, Ramaswamy, 4,399,265, Cl. 528-308.200.
Garware, Shashikant B.; and Ananthanarayanan, Ramaswamy, to Garware Plastics & Polyester Ltd. Process of products UV-stabilized polyester materials. 4,399,265, Cl. 528-308.200.
Gauhl, Helmgard; Seidel, Hans; Lang, Gunter; Roder, Albert; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Method and reagent for the determination of glycerin. 4,399,218, Cl. 435-25.000.
Gehring, Johann: *See*—
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,399,018, Cl. 204-199.000.
Geiersbach, Allois F.: *See*—
Downing, Terry R.; and Geiersbach, Allois F., 4,398,860, Cl. 414-634.000.
Geipel, Henry J., Jr.; and Nesbit, Larry A., to International Business Machines Corp. Method of fabricating a highly conductive structure. 4,398,341, Cl. 29-578.000.
Genco, Louis V.: *See*—
Tsak, Harry L.; Courtright, John F.; and Genco, Louis V., 4,398,685, Cl. 244-135.00A.
General Dynamics, Pomona Division: *See*—
Hix, Rudolf G.; and Bojorquez, Allen A., 4,399,464, Cl. 358-213.000.
Hix, Rudolf G.; and Bojorquez, Allen A., 4,399,464, Cl. 358-213.000.
Palmer, John P.; and Ward, Phillip B., Jr., 4,398,794, Cl. 350-96.190.
Palmer, John P., 4,398,795, Cl. 350-96.190.
Wedertz, Larry D.; and Ross, Oakley G., 4,398,797, Cl. 350-96.210.
General Electric Company: *See*—
Cole, Herbert S., 4,398,805, Cl. 350-345.000.
Crivello, James V.; and Lee, Julia L., 4,399,071, Cl. 260-440.000.
Eldred, Donald, 4,398,589, Cl. 164-337.000.
Espelage, Paul M., 4,399,395, Cl. 318-803.000.
Hammer, Edward E.; Lemmers, Eugene; and Swanson, Dail L., 4,399,391, Cl. 315-244.000.
Hauck, Robert B.; Gray, Floyd L.; and Brandt, Richard T., 4,399,550, Cl. 378-5.000.
Ipsen, Peter G., 4,398,393, Cl. 60-657.000.
Lee, Garland G., 4,399,251, Cl. 524-481.000.
Moore, Herbert E.; and Flanders, Thomas E., 4,399,547, Cl. 375-83.000.
Riederer, Stephen J.; Keyes, Gary S.; and Stone, Barry N., 4,399,457, Cl. 358-111.000.
General Foods Corporation: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased, 4,399,158, Cl. 426-112.000.
Hinman, David C.; Zemelman, Valery B.; and Ramakka, William R., 4,398,395, Cl. 62-1.000.
Kleiner, Fredric; Ramakka, William R.; and Zemelman, Valery B., 4,398,394, Cl. 62-1.000.
General Motors Corporation: *See*—
Buchanan, Harry C., Jr.; Graham, Donald E.; Cook, Keith R.; and Claude, George T., 4,398,704, Cl. 267-64.210.
Horvath, Robert A., 4,398,389, Cl. 60-545.000.
House, Ronnalee; Delapiane, John; and Davis, Ronald G., 4,399,335, Cl. 200-11.00R.
Lewis, Robert W., 4,398,825, Cl. 356-426.000.
Marks, Stephen W.; Wooten, Gary D.; and Gray, Ronald N., 4,399,379, Cl. 310-62.000.
Nemazi, John E., 4,398,511, Cl. 123-188.00M.
Perkins, Walton A., III; Rossol, Lothar; Dewar, Robert; and West, James K., 4,399,554, Cl. 382-8.000.
Siegel, Ekkehard, 4,398,873, Cl. 418-81.000.
General Signal Corp.: *See*—
Szilagyi, Dezso; Cunningham, John P.; and Bowlby, Robert L., 4,398,696, Cl. 251-307.000.
George, Clifford L., to Xerox Corporation. Sheet sorters. 4,398,712, Cl. 271-293.000.
Georgia Tech Research Institute: *See*—
Tedder, Daniel W., 4,399,000, Cl. 203-19.000.
Gerber, Bernard; and Felirath, Jean, to Centre Electronique Horloger SA. Non-volatile, electrically erasable and reprogrammable memory element. 4,399,523, Cl. 365-218.000.
Gernand, Martin O.: *See*—
Seiver, Robert L.; and Gernand, Martin O., 4,399,047, Cl. 252-62.550.
Geuns, Guy; and Rotzer, Georg, to Siemens Aktiengesellschaft. Arrangement for controlling advancing timbering in underground mining. 4,398,851, Cl. 405-302.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Stuckmann, Dieter; and Jutte, Hans, 4,398,845, Cl. 405-145.000.
Gewitz, Steven; and Elia, Raymond Z. A., to Teltec Inc. Telephone fault detection system. 4,399,333, Cl. 179-175.30F.
Giannetti, Enzo: *See*—
Ferraris, Mario; Rosati, Francesco; Parodi, Sandro; Giannetti, Enzo; Motroni, Giuseppe; and Albizzati, Enrico, 4,399,054, Cl. 252-429.00B.
Gillespie, Ronald G., to Texaco Development Corporation. Floating point amplifier. 4,399,416, Cl. 330-86.000.
Gillett, John E.; Isherwood, John; Hann, Richard A.; Norton-Berry, Philip; and Steel, Margaret L., to Imperial Chemical Industries PLC. Coating of solids. 4,398,493, Cl. 118-303.000.
Gillich, Thomas N.; Walls, John E.; Wanat, Stanley F.; and Rozell, William J., to American Hoechst Corporation. Novel electrolytes for electrochemically treated metal plates. 4,399,021, Cl. 204-38.00A.
Gillies, George M., to British Nuclear Fuels Limited. Method and apparatus for metering a feed of hydrogen fluoride vapor. 4,398,503, Cl. 122-31.00R.
Gillis, Robert E. Torus smoking pipe. 4,398,547, Cl. 131-216.000.
Gimpel, Jurgen; Feuerherd, Karl-Heinz; and Schesck, Hans-Uwe, to BASF Aktiengesellschaft. Surface-coating binders containing blocked isocyanate groups, and their use in cathodic electrocoating. 4,399,256, Cl. 525-111.000.
Ginsburg, Milton; and Dawson, C. Bruce, to Ginsey Industries, Inc. Hinge for toilet seat. 4,398,307, Cl. 4-236.000.
Ginsey Industries, Inc.: *See*—
Ginsburg, Milton; and Dawson, C. Bruce, 4,398,307, Cl. 4-236.000.
Glass Dimensions, Inc.: *See*—
Perkins, David R., 4,399,494, Cl. 362-163.000.
Glass, Gary L., to Du Pont de Nemours, E. I., and Company. Semiconductive elastomeric composition. 4,399,060, Cl. 252-511.000.
Glaxo Group Limited: *See*—
Bays, David E.; Clitherow, John W.; and Judd, Duncan B., 4,399,294, Cl. 549-495.000.
Clitherow, John W., 4,399,293, Cl. 549-494.000.
Gluckstein, Martin E.: *See*—
Rifkin, Ellis B.; Gluckstein, Martin E.; and Perilstein, Warren L., 4,398,921, Cl. 44-56.000.
Godfroid, Jean-Jacques; and Thuillier, Jean, to Agence Nationale de Valorisation de la Recherche (ANVAR). Bis(substituted phenoxyacetates) of N-alkyl-dialcanolamines and pharmaceutical compositions thereof. 4,399,299, Cl. 560-63.000.
Goegelman, Robert T.; and Treiber, Laszlo R., to Merck & Co., Inc. Isolation of non-ionic lipophilic materials on macroreticular polymeric absorbents. 4,399,274, Cl. 536-7.100.
Goldman, Max; and Alexoff, Carl. Method of fabricating and securing playing cards for instant lotteries and games. 4,398,708, Cl. 270-18.000.
Gonnason, Walter L., to Domtar Industries Inc. Method of classifying and comminuting a gypsum ore or the like. 4,398,673, Cl. 241-5.000.

Gony, Jean-Noel M.: *See—*
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Goo, Donovan: *See—*
Walters, Gerald A.; and Goo, Donovan, 4,398,578, Cl. 141-238.000.

Gooding, Elwyn R., to University of Michigan, The Regents of the. Chin strap safety attachment for protective headgear. 4,398,306, Cl. 2-421.000.

Goodyear Tire & Rubber Company, The: *See—*
Carson, William G., 4,399,260, Cl. 525-340.000.
Casey, William R., 4,398,492, Cl. 118-105.000.
Casey, William R., 4,398,583, Cl. 152-347.000.
Lattime, Richard R., 4,399,253, Cl. 524-565.000.
Senyek, Michael L., 4,399,240, Cl. 523-332.000.

Gorman, Gerald W.; and Gorman, Hal W., to Gorman, Hal W. Y-Interlock packing seal. 4,398,731, Cl. 277-124.000.

Gorman, Hal W.: *See—*
Gorman, Gerald W.; and Gorman, Hal W., 4,398,731, Cl. 277-124.000.

Gott, Hans: *See—*
Ritter, Klaus; Gott, Hans; Ritter, Gerhard; and Ritter, Josef, 4,399,342, Cl. 219-58.000.

Gottlieb, Michael M., to Rogers Corporation. High capacitance bus bar including multilayer ceramic capacitors. 4,399,321, Cl. 174-72.00B.

Gould, Herbert J., to International Rectifier Corporation. Method of manufacture of a schottky using platinum encapsulated between layers of palladium sintered into silicon surface. 4,398,344, Cl. 29-590.000.

Gowers, Elizabeth; and Todd, Martin H., to John Wyeth and Brother Limited. Treating shock. 4,399,129, Cl. 424-244.000.

Grabb, Frederick G., to Bendix Corporation, The. Movable end plate for a vacuum pump. 4,398,871, Cl. 417-283.000.

Grady, John K. X-Ray tube having rotatable transversely oscillatory anode. 4,399,551, Cl. 378-126.000.

Graham, Donald E.: *See—*
Buchanan, Harry C., Jr.; Graham, Donald E.; Cook, Keith R.; and Claude, George T., 4,398,704, Cl. 267-64.210.

Grande, Johannes; and Bittel, Raymond, to Rockwell International Corporation. Distributed digital data communications network. 4,399,531, Cl. 370-60.000.

Grant, Roy A.: *See—*
Oliver, Roy F.; and Grant, Roy A., 4,399,123, Cl. 424-95.000.

Granzow, Robert H.: *See—*
Horst, William R.; and Granzow, Robert H., 4,398,711, Cl. 271-263.000.

Graser, Earl J., to Manville Service Corporation. Returnable wraparound beverage carrier. 4,398,631, Cl. 206-427.000.

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Gray, Andrew C. G.: *See—*
Ten Haken, Pieter; Naisby, Thomas W.; and Gray, Andrew C. G., 4,399,149, Cl. 424-309.000.

Gray, Floyd L.: *See—*
Hauck, Robert B.; Gray, Floyd L.; and Brandt, Richard T., 4,399,550, Cl. 378-5.000.

Gray, Ian; and Harris, Richard G., to Procter & Gamble Company, The. Detergent additive compositions. 4,399,049, Cl. 252-91.000.

Gray, Ronald N.: *See—*
Marks, Stephen W.; Wooten, Gary D.; and Gray, Ronald N., 4,399,379, Cl. 310-62.000.

Grayson, Jacob H.: *See—*
Lowe, Charles L., 4,399,079, Cl. 261-36.00A.

Greco, Nicholas P., to Koppers Company, Inc. Preparation of 1,3-cyclic diones by vapor phase cyclization of delta-keto carboxylic acid esters utilizing carrier condensable under ambient conditions. 4,399,310, Cl. 568-346.000.

Green, Ralph R.: *See—*
Kruper, Wayne A.; and Green, Ralph R., 4,399,019, Cl. 204-212.000.

Greenberg, Joseph H., to Honeywell Information Systems Inc. Fiber optics high speed modem. 4,399,563, Cl. 455-607.000.

Greene, Peter D.: *See—*
Pitt, Gillies D.; Greene, Peter D.; Thrush, Edward J.; and Whysall, David H., 4,398,342, Cl. 29-580.000.

Greene, Waldo R., to PCI Group, Inc. Process and molding apparatus having a mold release coating on the cavity thereof for molding formable and homogeneous ceramic/polyester resin molding composition. 4,399,088, Cl. 264-54.000.

Greer, Matthew N.: *See—*
Ortloff, John E.; Greer, Matthew N.; and Gardner, Terry N., 4,398,487, Cl. 114-243.000.

Grens, John Z.: *See—*
Krikorian, Oscar H.; Grens, John Z.; and Parrish, William H., Sr., 4,399,108, Cl. 423-5.000.

Greve, James E., to CTS Corporation. Miniature rotary sip switch for mounting on a printed circuit board. 4,399,336, Cl. 200-11.00R.

Gries, Josef: *See—*
Steiner, Gerd; Gries, Josef; and Lenke, Dieter, 4,399,137, Cl. 424-250.000.

Grigat, Ernst: *See—*
Niederdellmann, Georg; Roemer, Norbert; Schenk, Jurgen; Hetzel, Hartmut; and Grigat, Ernst, 4,399,236, Cl. 521-49.000.

Grinberg, Jan: *See—*
Chow, Kuen; and Grinberg, Jan, 4,398,974, Cl. 148-171.000.

Groezinger, Marlo W.: *See—*
Moran, James S.; and Groezinger, Marlo W., 4,398,849, Cl. 405-221.000.

Gross, Chris, to United States of America, National Aeronautics and Space Administration. Self-correcting electronically scanned pressure sensor. 4,399,515, Cl. 364-571.000.

Grosscurt, Arnoldus C.: *See—*
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,399,152, Cl. 424-322.000.

Grube, Gerhard; and Engelke, Heinz, to Otto Haensel GmbH. Process and apparatus for detecting and sorting out inappropriately filled packages of filler material during a packaging process. 4,399,367, Cl. 250-560.000.

Grunenthal GmbH: *See—*
Graudums, Ivars; and Friderichs, Elmar, 4,399,145, Cl. 424-267.000.

Grunzweig + Hartmann und Glasfaser AG: *See—*
Kummermehr, Hans; and Mohr, Gunther, 4,399,175, Cl. 428-76.000.

GTE Automatic Electric Labs Inc.: *See—*
Butcher, James S.; Chan, Andrew; and Lind, Paul U., 4,399,499, Cl. 363-17.000.
Rinaldi, Gerald M., 4,399,412, Cl. 328-112.000.
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,399,369, Cl. 307-63.000.
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,399,533, Cl. 370-63.000.
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,399,534, Cl. 370-63.000.

GTE Laboratories Incorporated: *See—*
Buhrer, Carl F., 4,399,392, Cl. 315-308.000.

GTE Products Corporation: *See—*
Broadt, David R., 4,399,490, Cl. 362-11.000.
Kackenmeister, Carl F., 4,399,491, Cl. 362-11.000.
Sarin, Vinod K., 4,398,611, Cl. 175-413.000.

Guenther, Kenneth L.; and Zemke, Edward H., to Bell & Howell Company. Bar code printer with automatic mechanical parity. 4,398,459, Cl. 101-93.010.

Guibert, Raul, to Sunset Ltd. Hyperthermia technique. 4,398,535, Cl. 128-399.000.

Guibert, Raul, to Sunset Ltd. Vertable tray and lid assembly for heating foods. 4,399,159, Cl. 426-113.000.

Guibet, Jean-Claude; and Vandecasteele, Jean-Paul, to Institut Francais du Petrole. Blended fuels containing butyl alcohol acetone and methanol. 4,398,920, Cl. 44-56.000.

Guilbeau, Edgar A. Marine energy cell. 4,398,848, Cl. 405-212.000.

Guillot, Christian: *See—*
Schneider, Michel; Guillot, Christian; and Ayerbe, Andre, 4,399,221, Cl. 435-193.000.

Gulf Research & Development Company: *See—*
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,399,234, Cl. 518-715.000.
Stanulonis, John J.; Tabacek, Joseph A.; and Vogel, Roger F., 4,399,058, Cl. 252-438.000.

Gupta, Indra; Fostini, Raymond V.; and Moss, Timothy E., to Inland Steel Company. High strength cold rolled, weldable steel strip. 4,398,950, Cl. 75-124.000.

Gureghian, Richard S., to Barry Wright Corporation. Flexible fluid conductive coupling for fluid transfer systems. 4,398,755, Cl. 285-223.000.

Gustavsson, Lars-Erik, to Husqvarna Aktiebolag. Zigzag mechanism for a sewing machine. 4,398,481, Cl. 112-158.00R.

Guziec, Frank S., Jr., to Thiokol Corporation. 2,2'-Bipyridinium chlorochromate oxidant. 4,399,281, Cl. 546-9.000.

Gyorfi, Bela: *See—*
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Haas, Andras: *See—*
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Haberman, John P., to Texaco Inc. Means and method for protecting apparatus situated in a borehole from closure of the borehole. 4,398,597, Cl. 166-57.000.

Hacke, Walter; and Horn, Herman, to Diamond Shamrock Corporation. Injectable oxytetracycline compositions. 4,399,127, Cl. 424-227.000.

Haden Schweitzer Corporation: *See—*
Bradshaw, Norman F., 4,398,452, Cl. 98-115.0SB.

Haerten, Rainer, to Siemens Aktiengesellschaft. Ultrasonic-image device. 4,398,422, Cl. 73-626.000.

Haesen, Wilhelmus M. J.; and Keltjens, Gerardus M., to B.V. Neratoom. System for measuring the wall thickness of an object. 4,398,420, Cl. 73-597.000.

Haeussler, Ernst; Hatz, Ernst; Malmen, Olle; Schilla, Henning; and Schlick, Karl E., to Haeussler, Ernst. Pickup device for lifting concrete body. 4,398,762, Cl. 294-89.000.

Hafner, Kurt F., Jr., to United States of America, Navy. Low loss buoyant coaxial cable. 4,399,322, Cl. 174-101.500.

Haga, Takahiro: *See—*
Yokomichi, Isao; Haga, Takahiro; Komyoji, Terumasa; Nakajima, Toshio; and Matsuo, Norifusa, 4,399,143, Cl. 424-263.000.

Hagenberg, Peter: *See—*
Humme, Gert; Plato, Horst; Ott, Karl-Heinz; Kowitz, Friedrich; and Hagenberg, Peter, 4,399,273, Cl. 528-486.000.

Hagiwara, Hisao: *See—*
Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; Nokata, Kenichiro; and Hagiwara, Hisao, 4,399,282, Cl. 546-48.000.

Hagiwara, Toshihiko, to Olympus Optical Co., Ltd. Electrical surgical knife device. 4,398,534, Cl. 128-303.140.

Hahn & Clay: *See—*
Pechacek, Raymond E., 4,398,646, Cl. 220-3.000.

Hahn, Michael; Wackerle, Peter; Eschenfelder, Peter; and Schulz, Ralf-Thilo, to Messerschmitt-Bolkow - Blohm Gesellschaft mit Beschrankter Haftung. Mold half for laminated parts. 4,398,693, Cl. 249-155.000.

Hain, Johann: *See—*
Schuss, Werner; and Hain, Johann, 4,398,886, Cl. 433-128.000.

Hall, Allen L.: *See—*
Fayter, Richard G., Jr.; and Hall, Allen L., 4,399,076, Cl. 260-465.00F.

Hall, James. Demountable vehicle window screen. 4,398,586, Cl. 160-105.000.

Hall, Roger E. Breakaway safety base. 4,398,715, Cl. 273-25.000.

Hallford, Ben R., to Rockwell International Corporation. Full balun mixer. 4,399,562, Cl. 455-327.000.

Halliburton Company: *See—*
Ayers, William M.; Maheshwary, Ashok K.; and Young, Peter J., 4,399,040, Cl. 210-749.000.

Hallinger, Claude C.: *See—*
Camboulives, Andre A. M. L.; Hallinger, Claude C.; and Vandenbroucke, Roger A. J., 4,398,864, Cl. 415-134.000.

Hama, Yoshihisa: *See—*
Okudaira, Tadashi; Tsuboi, Akio; Sugihara, Shigeharu; and Hama, Yoshihisa, 4,398,642, Cl. 215-1.00C.

Hamada, Hiroshi; Yano, Kohzo; Koyanagi, Katubumi; Take, Hiroshi; and Inami, Yasuhiko, to Hamada, Hiroshi. Electrochromic display devices. 4,399,436, Cl. 340-812.000.

Hamada, Minoru: *See—*
Sakurai, Hisaya; Hamada, Minoru; Matsuzaki, Kazuhiko; and Aminaka, Muneaki, 4,399,272, Cl. 528-233.000.

Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Inoue, Ryuzaburou, to Nissan Motor Company, Limited. Plasma ignition system for internal combustion engine. 4,398,526, Cl. 123-606.000.

Hamano, Eizaburo; Koshigoe, Shinpei; and Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture tube with an electron gun having non-circular aperture. 4,399,388, Cl. 313-414.000.

Hamasaki, Mikihiko; and Oba, Kozo, to Hitachi Shipbuilding & Engineering Co., Ltd. Method of inspecting internal pressures in sealed containers. 4,399,514, Cl. 364-558.000.

Hambrick, Robert D., to National-Standard Company. Friction shock assembly for a forging hammer. 4,398,409, Cl. 72-453.010.

Hamill, Paul E., Jr.; and Kachik, Robert H., to United States Steel Corporation. Method of making a rim-stabilized steel ingot. 4,398,588, Cl. 164-53.000.

Hammer, Edward E.; Lemmers, Eugene; and Swanson, Dail L., to General Electric Company. Circuit for starting and operating fluorescent lamps. 4,399,391, Cl. 315-244.000.

Hang, Kenneth W.: *See—*
Prabhu, Ashok N.; and Hang, Kenneth W., 4,399,320, Cl. 174-68.500.

Hann, Richard A.: *See—*
Gillett, John E.; Isherwood, John; Hann, Richard A.; Norton-Berry, Philip; and Steel, Margaret L., 4,398,493, Cl. 118-303.000.

Hannigan, Norman J., to BS&B Engineering Company, Inc. Vessel access port. 4,398,923, Cl. 48-87.000.

Hans, Walter A., to Penjerdel Refrigeration Co., Inc. Self-balancing two stage heat recovery system. 4,398,397, Cl. 62-238.600.

Hansch, Egon, to Ferag AG. Method and apparatus for opening folded, bound or stitched multi-sheet products, especially printed products. 4,398,710, Cl. 270-55.000.

Hansen, Elo H.; and Ruzicka, Jaromir, to Bifok AB. Stop-flow analysis. 4,399,225, Cl. 436-34.000.

Hansen, Howard C., to Clark Equipment Company. Controller for electric traction motor. 4,398,618, Cl. 180-273.000.

Hanson, David W.; Nash, Richard C.; and Koehn, Richard R., to Fabcon, Incorporated. Device for lifting and tilting concrete panels. 4,398,761, Cl. 294-81.00R.

Harding, Edward M., to Equipment Development Company. Transport device for wheelless power driven equipment. 4,398,737, Cl. 280-47.13R.

Harikae, Nobuyuki: *See—*
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,399,153, Cl. 426-5.000.

Harloff, Bernd: *See—*
Schoppel, Roman; Fischer, Wolfgang; and Harloff, Bernd, 4,398,744, Cl. 280-504.000.

Harmon, Samuel R.: *See—*
McWhorter, Fred A.; and Harmon, Samuel R., 4,398,410, Cl. 72-457.000.

Harmsen, Lothar; Vennmann, Friedhelm; and Zieschang, Jurgen, to M.A.N. Maschinenfabrik Augsburg-Nurnberg. Method of lowering electrodes of an electric-arc furnace. 4,399,545, Cl. 373-94.000.

Harrell, James E.: *See—*
Casinelli, Dominic L., 4,398,593, Cl. 165-104.110.

Harris Corporation: *See—*
Merwarth, Richard J., 4,398,455, Cl. 100-7.000.

Harris, Edward H.: *See—*
Burke, Richard E.; Harris, Edward H.; and Bolton, Joseph W., 4,398,472, Cl. 110-250.000.

Harris, Louis W., Jr.; and Harris, Michael T. Paint shield. 4,398,495, Cl. 118-504.000.

Harris, Michael T.: *See—*
Harris, Louis W., Jr.; and Harris, Michael T., 4,398,495, Cl. 118-504.000.

Harris, Richard G.: *See—*
Gray, Ian; and Harris, Richard G., 4,399,049, Cl. 252-91.000.

Harris, Robert M.; and Betzold, Edward R., to FMC Corporation. Vertical loading system for a gun mount. 4,398,447, Cl. 89-46.000.

Harrison, Marc L.: *See—*
Blahut, Donald E.; Harrison, Marc L.; Killian, Michael J.; and Thierbach, Mark E., 4,399,516, Cl. 364-716.000.

Hartel, Edward O.; Libertini, Zoltan L.; Manente, Joseph C., Jr.; and Wilson, Donald E., to Avco Corporation. Composite ceramic/metal cylinder for gas turbine engine. 4,398,866, Cl. 415-180.000.

Hartford Steam Boiler Inspection and Insurance Company: *See—*
White, Dennis A., 4,398,421, Cl. 73-597.000.

Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, to BASF Aktiengesellschaft. Separating off organic iodine compounds from acetaldehyde-free carbonylation products of methanol, methyl acetate and dimethyl ether. 4,399,001, Cl. 203-70.000.

Hartmann & Lammle GmbH & Co. KG: *See—*
Schulze, Eckehart; and Kuttruf, Werner, 4,398,657, Cl. 226-11.000.

Harvel, Ervin R.: *See—*
Blake, Larry W.; Harvel, Ervin R.; Mason, Duane R.; and Wright, George M., 4,398,910, Cl. 604-93.000.

Harwood, Leopold A.; Shanley, Robert L., II; and Hettiger, James, to RCA Corporation. Video signal peaking control system with provision for automatic and manual control. 4,399,460, Cl. 358-166.000.

Hase, Alfred M. Two level constant voltage float charge rectifier and battery surveillance apparatus. 4,399,396, Cl. 320-43.000.

Hasegawa, Kiyoharu: *See—*
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,398,753, Cl. 282-27.500.

Hasegawa, Michio: *See—*
Onodera, Toshihiro; Inomata, Koichiro; Hasegawa, Michio; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,399,376, Cl. 307-415.000.

Hasegawa, Yoshio: *See—*
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,399,232, Cl. 501-38.000.

Hashimoto, Masashi: *See—*
Nakaguchi, Osamu; Okada, Satoshi; and Hashimoto, Masashi, 4,399,066, Cl. 260-112.50R.

Hashimoto, Toshio: *See—*
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,399,119, Cl. 423-626.000.

Hassall, Cedric H.; Lawton, Geoffrey; and Moody, Christopher J., to Hoffmann-La Roche Inc. Pyrazolopyridazine antihypertensives. 4,399,136, Cl. 424-250.000.

Hata, Hideo: *See—*
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,399,181, Cl. 428-213.000.

Hatton, Derald R.: *See—*
Kile, Gregory D.; Markham, Larry D.; Cruea, Ronald D.; and Hatton, Derald R., 4,399,028, Cl. 209-164.000.

Hattori, Katsuhide; Fukatsu, Yoshiaki; and Torii, Akio, to Nippon Oil and Fats Company, Limited. Water-in-oil emulsion explosive composition. 4,398,976, Cl. 149-21.000.

Hatz, Ernst: *See—*
Haeusler, Ernst; Hatz, Ernst; Malmen, Olle; Schilla, Henning; and Schlick, Karl E., 4,398,762, Cl. 294-89.000.

Hauck, Robert B.; Gray, Floyd L.; and Brandt, Richard T., to General Electric Company. Spinning filter for X-ray apparatus. 4,399,550, Cl. 378-5.000.

Havekost, Peter: *See—*
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,398,867, Cl. 415-219.00C.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Percussor. 4,398,531, Cl. 128-55.000.

Hawley, Kenneth R., to Bunker Ramo Corporation. Dynamic disk buffer control unit. 4,399,503, Cl. 364-200.000.

Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohisa; and Ito, Hiroyuki, to Ono Pharmaceutical Co. Ltd. Prostaglandin 12 analogues and their pharmaceutical compositions. 4,399,147, Cl. 424-285.000.

Hayashi, Osamu: *See—*
Iwabuchi, Tadashi; and Hayashi, Osamu, 4,399,190, Cl. 428-336.000.
Iwabuchi, Tadashi; and Hayashi, Osamu, 4,399,191, Cl. 428-336.000.

Hayashi, Tadakuni: *See—*
Tanasawa, Yasusi; Hayashi, Tadakuni; and Muto, Norio, 4,398,513, Cl. 123-255.000.

Hayes, Jess W. Magnifying device for a hand-held implement. 4,398,800, Cl. 350-251.000.

Hazleton Systems, Inc.: *See—*
Moss, Owen R.; and Briant, James K., 4,398,498, Cl. 119-15.000.

Heath, Trevor C.: *See*—
Willis, John H.; and Heath, Trevor C., 4,398,934, Cl. 65-2.000.
Hebel, Carl: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased, 4,399,158, Cl. 426-112.000.
Hedrick, Paul A., to Essex Group, Inc. Electrical connector and method of making same. 4,398,785, Cl. 339-196.00R.
Hegberg, Richard A., to Tour & Andersson Aktiebolag. Heating system with steam radiators. 4,398,663, Cl. 237-9.00R.
Heinrich, William P.: *See*—
Leopoldi, Norbert; and Heinrich, William P., 4,399,495, Cl. 362-189.000.
Heintz, Gary R. Adjustable waxless ski base. 4,398,746, Cl. 280-604.000.
Heinz Kaiser AG: *See*—
Pape, Dieter; and Woerz, Hans, 4,398,854, Cl. 408-185.000.
Heisler, Robert W., to J-M Manufacturing Company Inc. Pipe section including a gasketed spigot end and method of making the same. 4,398,726, Cl. 277-1.000.
Heitzman, Charles J., to Auto-Cast International, Ltd. Building construction system component parts and method for assembling same. 4,398,378, Cl. 52-251.000.
Helgeson, William D.: *See*—
Underhill, Lloyd J.; and Helgeson, William D., 4,398,346, Cl. 29-623.500.
Henderson, Henry L.: *See*—
Jacocks, James L.; and Henderson, Henry L., 4,398,415, Cl. 73-147.000.
Hendrick, Michael E.: *See*—
Brennan, Thomas M.; and Hendrick, Michael E., 4,399,163, Cl. 426-548.000.
Hendrickson, James L.: *See*—
Fuller, Charles C.; and Hendrickson, James L., 4,398,714, Cl. 273-25.000.
Henrich, Werner. Winding apparatus for strand type materials. 4,398,677, Cl. 242-25.00R.
Henry, Paul S., to Bell Telephone Laboratories, Incorporated. Fast real-time public key cryptography. 4,399,323, Cl. 178-22.140.
Hensley, Albert L., Jr.; and Quick, Leonard M., to Standard Oil Company (Indiana). Catalyst and support, their methods of preparation, and processes employing same. 4,399,057, Cl. 252-435.000.
Henson, Dennis R. Fuel conservation device. 4,398,523, Cl. 123-557.000.
Herko Pyrolyse GmbH & Co. Recycling KG: *See*—
Thomanetz, Erwin, 4,398,471, Cl. 110-235.000.
Herman, Thomas; and Lidow, Alexander, to International Rectifier Corporation. Composite metal and polysilicon field plate structure for high voltage semiconductor devices. 4,399,449, Cl. 357-53.000.
Herscher, Lee R., to Roper Corporation. Garden tiller with extended drag shield. 4,398,606, Cl. 172-42.000.
Herwig, Walter; Erbes, Kurt; Decker, Rudolf; and Sikora, Helga, to Hoechst Aktiengesellschaft. Elastomeric, ethylenically unsaturated polyurethanes and radiation polymerizable mixtures containing such polyurethanes. 4,399,239, Cl. 521-137.000.
Hettiger, James: *See*—
Harwood, Leopold A.; Shanley, Robert L., II; and Hettiger, James, 4,399,460, Cl. 358-166.000.
Hetzel, Hartmut: *See*—
Niederdellmann, Georg; Roemer, Norbert; Schenk, Jurgen; Hetzel, Hartmut; and Grigat, Ernst, 4,399,236, Cl. 521-49.000.
Hewlett-Packard Company: *See*—
Fang, Robert C. Y.; and Chiu, Kuang Y., 4,398,992, Cl. 156-643.000.
Heybey, Otfried W. G.: *See*—
Kirby, David B.; and Heybey, Otfried W. G., 4,399,093, Cl. 264-328.200.
Heymer, Gero: *See*—
Maurer, Alexander; Heymer, Gero; and Erpenbach, Markus, 4,399,114, Cl. 423-321.00R.
Hibbard, Earl R. Optical scanning system. 4,399,470, Cl. 358-284.000.
Hicks, John R., to Nuclear Systems, Inc. System for monitoring utility usage. 4,399,510, Cl. 364-464.000.
Higashi, Takehito: *See*—
Shiroto, Yoshimi; Higashi, Takehito; and Ono, Takeo, 4,399,026, Cl. 208-216.0PP.
Highland Agro Inc.: *See*—
Moran, James S.; and Groezinger, Marlo W., 4,398,849, Cl. 405-221.000.
Highstreet, Edward J.: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,399,042, Cl. 210-791.000.
Higo, Shoichi: *See*—
Onodera, Toshihiro; Inomata, Koichiro; Hasegawa, Michio; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,399,376, Cl. 307-415.000.
Higuchi, Kazuya: *See*—
Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, 4,398,699, Cl. 266-50.000.
Hillenbrand, Gary F.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,399,209, Cl. 430-138.000.
Hilton, Carl W., to Return on Investment Corporation. Athletic shoe. 4,398,358, Cl. 36-114.000.
Hinman, David C.; Zemelman, Valery B.; and Ramakka, William R., to General Foods Corporation. Carbonated ice process and product. 4,398,395, Cl. 62-1.000.
Hinze, Adrien G.; Roggeveen, Robert P.; and Meulenberg, Abraham J., to Emery Industries, Inc. Polyalkene having improved dyeability modified with polyamide. 4,399,258, Cl. 525-184.000.
Hipp, Karl H.; and Martz, Josef, to Bayerische Motoren Werke Aktiengesellschaft. Device for adjustably fastening a belt fitting to an automobile body. 4,398,749, Cl. 280-801.000.
Hirakawa, Tadashi: *See*—
Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,398,328, Cl. 29-126.000.
Hiramatsu, Kinuo, to Kawasaki Jukogyo Kabushiki Kaisha. Anti-nosedive apparatus of a motorcycle. 4,398,741, Cl. 280-283.000.
Hirano, Koki, to Jidosha Denki Kogyo Kabushiki Kaisha. Air cooled wiper motor. 4,399,380, Cl. 310-62.000.
Hirano, Takashi, to Yamato Scale Company, Ltd. Device for grouping articles by combination selection so as to have the predetermined number. 4,398,613, Cl. 177-25.000.
Hirata, Kazuhiko: *See*—
Kojima, Hajime; Kurita, Yukio; Hirata, Kazuhiko; Nakagawa, Satoshi; and Ueoka, Takahira, 4,398,841, Cl. 403-173.000.
Hirayama, Katsuhisa: *See*—
Emoto, Kanji; Onishi, Masayuki; Yamada, Hirosuke; Hirayama, Katsuhisa; Ohzu, Hideshi; Ogawa, Masakatsu; and Masuda, Yasuo, 4,398,948, Cl. 75-60.000.
Hiroishi, Takashi: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhi.o; Yamamoto, Yuji; and Nakashima, Ryoji, 4,399,089, Cl. 264-57.000.
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Hirsbrunner, Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Pharmaceutical carrier and compositions. 4,399,128, Cl. 424-230.000.
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Sukegawa, Hiromu; and Tomisawa, Yoshiaki, 4,398,728, Cl. 277-12.000.
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Nagahara, Kazuyuki, 4,399,201, Cl. 429-48.000.
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Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; and Machizawa, Kenji, 4,398,399, Cl. 62-475.000.
Koike, Takeshi; and Shibata, Atsushi, 4,399,365, Cl. 250-492.200.
Maegawa, Muneo, 4,398,725, Cl. 277-192.000.
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Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
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Hitchner, John A.; and Klipp, Henry A., to Virginia Industries, Inc. Roller skate bearing. 4,398,329, Cl. 29-148.40R.
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Vanderveen, John W.; Hitzman, Donald O.; and Wegner, Eugene H., 4,399,223, Cl. 435-261.000.
Hix, Rudolf G.; and Bojorquez, Allen A., to General Dynamics, Pomona Division; and General Dynamics, Pomona Division. Signal processor for an array of CID radiation detector elements. 4,399,464, Cl. 358-213.000.
Hlavinka, Dennis J.; Johnson, Steven H.; and Zook, James L., to Cobe Laboratories, Inc. Rinsing, cleaning and disinfecting dialysate preparation and supply apparatus. 4,399,030, Cl. 210-91.000.
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Athey, Stuart E.; and McCord, Dick P., 4,398,835, Cl. 374-14.000.
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Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,399,001, Cl. 203-70.000.
Hodges, Marvin P.; and Buchroeder, Richard A., to B Optical. Fresnel lens system. 4,398,810, Cl. 350-452.000.
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Hodson, Ralph; Davies, Kenneth J.; Brown, Glen J. L.; Carroll, William L.; and Noble, Robert, to Cempol Sales Limited. Making lightweight concrete. 4,398,958, Cl. 106-90.000.
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Diskowski, Herbert; Krause, Johannes; and Mandelkow, Dietrich, 4,399,037, Cl. 210-721.000.
Herwig, Walter; Erbes, Kurt; Decker, Rudolf; and Sikora, Helga, 4,399,239, Cl. 521-137.000.
Keil, Karl-Heinz; May, Adolf; and Bucking, Hans-Walter, 4,399,043, Cl. 252-8.700.
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Hofmann, Heinrich; Markfelder, Gunter; and Troster, Manfred, to Fag Kugelfischer Georg Schafer & Co. Journal bearing with one axially divided inner or outer ring. 4,398,775, Cl. 308-201.000.
Hofmann, Karl, to Robert Bosch GmbH. Fuel injection valve for an internal combustion engine. 4,398,670, Cl. 239-533.900.
Hokkaido Sugar Co., Ltd.: *See*—
Iwasaki, Yosimi, 4,398,477, Cl. 110-346.000.
Holdahl, Robert A.; and Petersen, Paul S., to Toolmark Co. Lathe work centers. 4,398,579, Cl. 142-53.000.
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Holmbo, Dwight N., to Medtronic, Inc. Independently rate-adjusting multiple channel controller for nerve stimulator transmitter. 4,398,537, Cl. 128-420.00R.
Holmes, Henry C.; and Johnson, Roderick D., to International Paper Company. Energy absorbing corrugated paper container. 4,398,650, Cl. 220-443.000.
Holmquist, Leif T.; and Carlson, Lars A., to Laborstoires Goella. Process and a device for the determination of serum lipoproteins. 4,399,217, Cl. 435-7.000.
Holroyd, Eric; and Perkins, David J. B., to W & A Bates Limited. Reinforced articles. 4,399,187, Cl. 428-295.000.
Honda, Yukio: *See*—
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Bulleyment, Keith J., 4,399,370, Cl. 307-112.000.
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Honeywell Information Systems Inc.: *See*—
Greenberg, Joseph H., 4,399,563, Cl. 455-607.000.
Lakhani, Kishor M.; and Ligon, Jerry L., 4,399,447, Cl. 346-155.000.
Hoogendonk, Johan W.; and Lucassen, Servatius J., to Unie van Kunstmestfabrieken, B.V. Process for the preparation of a granular NPK fertilizer and granular NPK fertilizers obtained by this process. 4,398,936, Cl. 71-36.000.
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Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Process for treating moist compositions containing pollution-causing substances. 4,398,956, Cl. 106-85.000.
Hope, Dana R., to United States of America, Air Force. Rudder pedal grip assembly. 4,398,430, Cl. 73-862.540.
Horn, Herman: *See*—
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Horner, Joseph L.; and Ludman, Jacques E., to United States of America, Air Force. Holographic coupler for fiber optic systems. 4,398,792, Cl. 350-96.190.
Horowitz, Alexandre; and Willemsen, Henricus P., to Varitrac AG. Clamping device. 4,398,847, Cl. 405-199.000.
Horst, William R.; and Granzow, Robert H., to NCR Corporation. Currency dispenser monitor. 4,398,711, Cl. 271-263.000.
Horvath, Robert A., to General Motors Corporation. Demand type power brake system. 4,398,389, Cl. 60-545.000.
Hosiden Electronics Co., Ltd.: *See*—
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Hounsfield Godfrey N., to EMI Limited. Apparatus for examining a body by radiation such as X or gamma radiation. 4,399,509, Cl. 364-414.000.
House, Ronnalee; Delaplane, John; and Davis, Ronald G., to General Motors Corporation. Switch actuator assembly. 4,399,335, Cl. 200-11.00R.
Houze, Bernard: *See*—
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Howe, Robert K.; and Lee, Len F., to Monsanto Company. Herbicidal composition and method. 4,398,941, Cl. 71-90.000.
Hoyle, Nick D.: *See*—
Crabb, Elmer R.; and Hoyle, Nick D., 4,398,617, Cl. 180-235.000.
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Milligan, John D., 4,398,852, Cl. 406-47.000.
Hsieh, C. Richard; and Roberts, Paul T., to Chevron Research Company. Sulfur oxide reduction in a coal gasification process. 4,398,924, Cl. 48-202.000.
Hsu, David S. Y.; and Manuccia, Thomas J., Jr., to United States of America, Navy. Separation of hydrogen isotopes. 4,399,011, Cl. 204-163.00R.
Hubner, Herbert: *See*—
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Hudson Oxygen Therapy Sales Company: *See*—
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Huffman, Ronald E., to KV33 Corporation. Dental model. 4,398,884, Cl. 433-74.000.
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Hughes, Paul R.; and Campbell, John E., to United Brands Company. Thermostat. 4,399,428, Cl. 340-500.000.
Hultquist, John V. Toggle type fastener. 4,398,855, Cl. 411-340.000.
Hume, David W., Jr.; and Rasile, John, to International Business Machines Corporation. Neutralizing chloride ions in via holes in multilayer printed circuit boards. 4,398,993, Cl. 156-643.000.
Humme, Gert; Plato, Horst; Ott, Karl-Heinz; Kowitz, Friedrich; and Hagenberg, Peter, to Bayer Aktiengesellschaft. Process for the removal of residual monomers from ABS polymers. 4,399,273, Cl. 528-486.000.
Huneidi, Farouk, to United States of America, National Aeronautics and Space Administration. Device for determining frost depth and density. 4,398,412, Cl. 73-32.00R.
Hunter, Edwin J., to Toro Company, The. Stream rotor sprinkler. 4,398,666, Cl. 239-222.130.
Hunter, Joe M.: *See*—
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Hunter, LeRoy: *See*—
Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, LeRoy, 4,398,654, Cl. 222-402.100.
Hunter, Shubert J. Multi-span skyline logging system. 4,398,640, Cl. 212-76.000.
Huntington Alloys, Inc.: *See*—
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Hwang Lii, Chaur-Chiang. Type of structure for newspaper clip. 4,398,752, Cl. 281-47.000.
Hyde, Thomas J., to Du Pont de Nemours, E. I., and Company. Filled polyamide compositions with silanes and sulfonamides. 4,399,246, Cl. 524-169.000.
Iantosca, Philip D., to Instrumentation Laboratory Inc. Manipulating tool. 4,398,333, Cl. 29-235.000.
Ichiki, Takemoto; Yoshida, Ryo; Sumida, Seizo; and Katsuzo, Kamoshita, to Sumitomo Chemical Company, Limited. N-Phenyl-N-methylurea derivatives. 4,399,072, Cl. 260-453.0RW.
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Nakashima, Kazuyuki; Araki, Youichi; Igarashi, Yukio; and Kojima, Shinjiro, 4,399,452, Cl. 357-74.000.
Iida, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas-insulated electric apparatus. 4,399,315, Cl. 174-21.00C.
Iizuka, Yutaka, to Nippon Kogaku K. K. Zoom lens. 4,398,807, Cl. 350-427.000.
Ikari, Hirotake; and Kakizaki, Kanichi, to Rohm and Haas Company. Herbicidally-active phenylacetonitriles. 4,398,942, Cl. 71-92.000.
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, to Sanyo Electric Co., Ltd. Lithium battery. 4,399,202, Cl. 429-91.000.
Ikeda, Nobumasa: *See*—
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Iler, Ralph K.; Queneau, Paul B.; and Cooperrider, Mark W., to Compagnie Francaise d'Entreprises Minieres, Metallurgiques et d'Investissements. Control of silica scaling during acid leaching of lateritic ore. 4,399,109, Cl. 423-141.000.
Illinois Tool Works Inc.: *See*—
Bakker, John A.; and French, Edward C., 4,398,324, Cl. 24-230.00R.
Imamura, Shinzo; Sato, Haruyo; and Kuramoto, Hiroyoshi, to Toray Industries, Inc. 2-Diphenylmethyleneamino-3-indolylpropionsitrile and alkyl esters of 2-diphenylmethylene-amino-3-indolylpropionic acid. 4,399,289, Cl. 548-507.000.
Imanishi, Masamichi: *See*—
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Imano, Shiro; Sasaki, Yoshio; Otsuka, Yukio; and Nisidome, Teruo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Biological sewage treatment apparatus of the rotary disc type. 4,399,031, Cl. 210-150.000.
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Belbin, Geoffrey R.; and Cogswell, Frederic N., 4,399,085, Cl. 264-41.000.
Gillett, John E.; Isherwood, John; Hann, Richard A.; Norton-Berry, Philip; and Steel, Margaret L., 4,398,493, Cl. 118-303.000.
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Inao, Fumiya, to Agency of Industrial Science & Technology. Method of connecting pipe pieces via universal joint. 4,398,331, Cl. 29-157.00R.
Inden, Masato: *See*—
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Inoue, Kiyoshi, 4,399,482, Cl. 361-145.000.
Inoue, Kazunari: *See*—
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Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Centering controller for a tool electrode on an electrical machine tool. 4,398,350, Cl. 33-185.00R.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method and apparatus for making a composite carbon material. 4,399,083, Cl. 264-23.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Magnetic holder. 4,399,482, Cl. 361-145.000.
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Inoue, Yasuhide; Ikezawa, Kenji; and Kimura, Shinji, to Nissan Motor Company, Limited. Gas sensor having lead wires extending in insulating and hermetically sealed holder. 4,399,017, Cl. 204-425.000.
Inoue, Yukio: *See*—
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Cormier, Alan D.; Czaban, John D.; Schillinger, Thomas J.; Legg, Kenneth D.; and Kelley, Thomas F., 4,399,362, Cl. 250-430.000.
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Interface Mechanisms: *See*—
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International Business Machines Corporation: *See*—
Bergendahl, Albert S., 4,399,205, Cl. 430-30.000.
Cosgrove, Michael R., deceased; Frey, Alexander H., Jr.; Moore, Kenneth A.; Peled, Abraham; Ris, Frederic N.; and Sproul, William W., III, 4,399,507, Cl. 364-200.000.
Evans, Charles W.; Flusche, Frederick O.; Messina, Benedicto U.; Richardson, Ethel L.; Robinson, James R.; and Wetzel, Joseph A., 4,399,506, Cl. 364-200.000.
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Boden, Richard M., 4,399,063, Cl. 252-522.00R.
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International Laser Systems, Inc.: *See*—
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International Paper Company: *See*—
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International Rectifier Corporation: *See*—
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Kelly, Michael J., 4,398,783, Cl. 339-177.00E.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Brown, Kenneth D.; and O'Neill, Terence C., 4,399,182, Cl. 428-215.000.
Ipsen, Peter G., to General Electric Company. Steam turbine control apparatus. 4,398,393, Cl. 60-657.000.
IRD Mechanalysis, Inc.: *See*—
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Ishida, Kohji; and Numata, Tatsuo, to Pioneer Electronic Corporation. Multiplex demodulation circuit. 4,399,324, Cl. 179-1.0GD.
Ishigaki, Yukinobu: *See*—
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Ishikawa, Takeshi, to Nissan Motor Co. Ltd. Cover plate for spare wheel housing. 4,398,765, Cl. 296-37.200.
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Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohita; and Ito, Hiroyuki, 4,399,147, Cl. 424-285.000.
Ito, Shuzo: *See*—
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; and Fujimoto, Hideaki, 4,398,949, Cl. 75-60.000.
Ito, Susumu: *See*—
Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, 4,398,699, Cl. 266-50.000.
Ito, Takao: *See*—
Ohsawa, Kenji; Ito, Takao; Tanno, Koichiro; Ohsawa, Masayuki; and Kurata, Keiji, 4,398,975, Cl. 148-400.000.
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; and Machizawa, Kenji, to Hitachi, Ltd. Hermetically circulating, absorption type refrigerator. 4,398,399, Cl. 62-475.000.
ITT Corporation: *See*—
Sears, Karl D., 4,399,275, Cl. 536-70.000.
ITT Industries, Inc.: *See*—
Rigby, Leslie J., 4,399,424, Cl. 338-34.000.
Ivac Corporation: *See*—
Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., 4,398,542, Cl. 128-675.000.

Ivers-Lee AG: *See—*
Kuhni, Heinz; and Schwaninger, Peter, 4,398,990, Cl. 156-510.000.
Iwabuchi, Tadashi; and Hayashi, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Thin insulating mica sheet and insulated coil. 4,399,190, Cl. 428-336.000.
Iwabuchi, Tadashi; and Hayashi, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Thin insulating mica sheet and insulated coil. 4,399,191, Cl. 428-336.000.
Iwano, Yoshimi: *See—*
Suzuki, Hajime; Iwano, Yoshimi; and Arakawa, Akio, 4,398,570, Cl. 139-370.200.
Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Rotational angle sensor. 4,398,419, Cl. 73-518.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Soma, Masafumi; and Kohno, Yoshihiko, 4,399,512, Cl. 364-487.000.
Iwasaki, Yosimi, to Hokkaido Sugar Co., Ltd. Method for generation of hot gas by incineration of combustible material and apparatus for generation of hot gas by incineration of combustible material. 4,398,477, Cl. 110-346.000.
Izawa, Susumu: *See—*
Akiyama, Hiroyuki; Izawa, Susumu; Hirosawa, Kuninori; and Inada, Hideharu, 4,399,087, Cl. 264-53.000.
J. B. Foote Foundry Co., The: *See—*
Wood, Thomas D.; and Reiss, Garry K., 4,398,899, Cl. 474-37.000.
J-M Manufacturing Company Inc.: *See—*
Heisler, Robert W., 4,398,726, Cl. 277-1.000.
Jablonski, Dane E., to B. F. Goodrich Company, The. Acrylate rubber compositions. 4,399,262, Cl. 525-349.000.
Jackson, LeRoy E.: *See—*
Bok, Song H.; Jackson, LeRoy E.; Schroedel, Cynthia J.; and Seidman, Martin, 4,399,222, Cl. 435-234.000.
Jacobs Manufacturing Company, The: *See—*
Custer, Dennis R., 4,398,510, Cl. 123-90.160.
Jacoby, Charles H., to Occidental Research Corporation. Method for fragmenting underground formations by hydraulic pressure. 4,398,769, Cl. 299-4.000.
Jacocks, James L.; and Henderson, Henry L., to United States of America, Air Force. Swing link flexible wind tunnel nozzle. 4,398,415, Cl. 73-147.000.
Jacuone, Roberto: *See—*
Rossi, Pier P.; Jacuone, Roberto; and Magnoni, Franco, 4,399,292, Cl. 549-431.000.
Jaffrennou, Bernard; and Cessou, Maurice, to Institut Francais du Petrole; and Societe Rolba. Floating boom structure. 4,398,844, Cl. 405-72.000.
James Burn Bindings Limited: *See—*
Archer, Derek J.; and Jones, Leonard W. N., 4,398,856, Cl. 412-39.000.
Janich, Hans-Jurgen. Pivotal flap. 4,398,697, Cl. 251-308.000.
Janssen, Craig R., to Padco, Inc. Method for smoothing wallboard tape joints. 4,399,170, Cl. 427-336.000.
Janssen, Donovan M.; Magno, Robert; and Seaward, William S., to International Business Machines Corporation. Wave generation amplification apparatus for cut sheet paper feeding. 4,398,709, Cl. 271-10.000.
Janzen, Harlo W. Pipe thread protector apparatus. 4,398,566, Cl. 138-96.00T.
Japan Styrene Paper Corporation: *See—*
Akiyama, Hiroyuki; Izawa, Susumu; Hirosawa, Kuninori; and Inada, Hideharu, 4,399,087, Cl. 264-53.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Matsumura, Yoshio; Nozue, Ikuo; Tomomitsu, Osahiko; Ukachi, Takashi; and Suminoe, Taro, 4,399,266, Cl. 528-10.000.
Jarret, Bertrand; and Cordier, Rose, to Lignes Telegraphiques et Telephoniques. Device for triggering an alarm system in the event of insufficiency of the transmission level, for the receiver module of an optical-fiber transmission system. 4,399,565, Cl. 455-612.000.
Jautelat, Manfred; Stetter, Jorg; and Arlt, Dieter, to Bayer Aktiengesellschaft. Preparation of 1-aryloxy-methyl ketones. 4,399,309, Cl. 568-322.000.
Jefferies, Patrick J.: *See—*
Schmidt, Paul J.; and Jefferies, Patrick J., 4,399,291, Cl. 549-308.000.
Jendrisak, Aloysius A.: *See—*
Darling, Stephen D.; Jendrisak, Aloysius A.; and Bokmiller, David J., 4,398,888, Cl. 434-278.000.
Jenkins, James H. Magnetic smoke and fire shield. 4,398,371, Cl. 49-7.000.
Jensen, Dale H.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,398,483, Cl. 114-56.000.
Jeromin, Lothar S.; and Kahler, Wayne L., to Xerox Corporation. Liquid toner fountain for the development of electrostatic images. 4,398,818, Cl. 355-10.000.
Jette, Emile. Showerhead control. 4,398,668, Cl. 239-414.000.
Jidosha Denki Kogyo Kabushiki Kaisha: *See—*
Hirano, Koki, 4,399,380, Cl. 310-62.000.
Jin, Sungho: *See—*
Bordelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,398,972, Cl. 148-31.550.
Joerger, John R., to Kearney & Trecker Corporation. Collet unclamping mechanism. 4,398,326, Cl. 29-26.00A.
John D. Brush & Co., Inc.: *See—*
Williams, Alvin R.; and Shaffer, Douglas E., 4,398,470, Cl. 109-52.000.
John Wyeth and Brother Limited: *See—*
Crossley, Roger, 4,399,144, Cl. 424-263.000.
Gowers, Elizabeth; and Todd, Martin H., 4,399,129, Cl. 424-244.000.
Johns, Paul J., to Motion Marker Systems, Incorporated. Erasable magnetic diagramming panel. 4,398,893, Cl. 434-305.000.
Johnson, Christina E., to Olga Company. Womens soft fabric garment with integral brassiere. 4,398,538, Cl. 128-432.000.
Johnson, Matthey & Co., Limited: *See—*
McGill, Ian R.; and Selman, Gordon L., 4,399,199, Cl. 428-633.000.
Johnson Matthey Public Limited Company: *See—*
Russell, Michael J. H.; and Murrer, Barry A., 4,399,312, Cl. 568-454.000.
Johnson, Roderick D.: *See—*
Holmes, Henry C.; and Johnson, Roderick D., 4,398,650, Cl. 220-443.000.
Johnson, Steven H.: *See—*
Hlavinka, Dennis J.; Johnson, Steven H.; and Zook, James L., 4,399,030, Cl. 210-91.000.
Johnson, Thomas A.: *See—*
Ford, Michael E.; and Johnson, Thomas A., 4,399,308, Cl. 564-479.000.
Jones, Clarence L., to Ocean Research Industries of North America. Automatic float switch. 4,399,338, Cl. 200-84.00R.
Jones, Edwin V., to National Research Development Corporation. Selectively operable bit-serial logic circuit. 4,399,377, Cl. 307-465.000.
Jones, Gregory E., to British Gas Corporation. Control circuit and fuel burner incorporating a control circuit. 4,399,537, Cl. 371-14.000.
Jones, Lawrence T.; Howden, Ashley; Knighton, Mark S.; Sims, Anson; Kittinger, David L.; and Hollander, Richard E., to California R & D Center. Robot computer chess game. 4,398,720, Cl. 273-238.000.
Jones, Leonard W. N.: *See—*
Archer, Derek J.; and Jones, Leonard W. N., 4,398,856, Cl. 412-39.000.
Joseph, Eric D., to Motorola, Inc. Precision current source. 4,399,399, Cl. 323-315.000.
Joyce, James J.: *See—*
Wilson, Wayne D.; and Joyce, James J., 4,398,724, Cl. 273-411.000.
Judd, Duncan B.: *See—*
Bays, David E.; Clitherow, John W.; and Judd, Duncan B., 4,399,294, Cl. 549-495.000.
Jue, Clifford T., to Interface Mechanisms. Label cutter for impact printers. 4,398,441, Cl. 83-575.000.
Jujo Paper Co., Ltd.: *See—*
Yamato, Noboru; and Satake, Tosimi, 4,399,188, Cl. 428-320.400.
Jurek, Dennis J., to Square D Company. Power factor monitoring and control system for resistance welding. 4,399,511, Cl. 364-477.000.
Jutte, Hans: *See—*
Stuckmann, Dieter; and Jutte, Hans, 4,398,845, Cl. 405-145.000.
Kabashima, Akemi: *See—*
Matsuishi, Tsutomu; Maruyama, Hiromasa; Kitahara, Toshio; Kabashima, Akemi; and Toyomasu, Ryuta, 4,399,304, Cl. 562-445.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Tanaka, Kojiro, 4,398,833, Cl. 368-156.000.
Kabushiki Kaisha Daisei Kikai: *See—*
Suzuki, Tomosaburo; and Wakahara, Akira, 4,398,983, Cl. 156-185.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Kakita, Yukio; and Mikami, Yoshiharu, 4,398,614, Cl. 177-25.000.
Mikami, Yoshiharu; Sashiki, Takashi; and Asai, Yoshiharu, 4,398,612, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Fukuda, Masahito; Tanabe, Akiyoshi; Moriguchi, Yasuo; Nagai, Nobuyuki; Tsuji, Kunio; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Mizuta, Atsuo, 4,398,406, Cl. 72-42.000.
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; and Fujimoto, Hideaki, 4,398,949, Cl. 75-60.000.
Sugino, Morihiko, 4,399,052, Cl. 252-421.000.
Tanaka, Yoshiro; Fujii, Noritsugu; Akagi, Kazuo; and Shitamatsu, Ryujiro, 4,398,552, Cl. 134-57.00R.
Kabushiki Kaisha Kyoto Daiichi Kagaku: *See—*
Yamamoto, Hiroshi, 4,398,894, Cl. 436-517.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Toyama, Akira, 4,399,553, Cl. 382-7.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Koike, Isomu, 4,398,461, Cl. 101-99.000.
Wakai, Youichi, 4,398,834, Cl. 368-223.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Ogawa, Hisashi; and Tsuge, Hiroshi, 4,398,680, Cl. 242-107.200.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Suzuki, Hajime; Umemura, Yoshifumi; and Tanaka, Shigeru, 4,398,569, Cl. 139-88.000.
Suzuki, Hajime; Iwano, Yoshimi; and Arakawa, Akio, 4,398,570, Cl. 139-370.200.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Tanasawa, Yasusi; Hayashi, Tadakuni; and Muto, Norio, 4,398,513, Cl. 123-255.000.
Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See—*
Ueno, Ryuzo; Matsuda, Toshio; and Inamine, Shigeo, 4,399,150, Cl. 424-317.000.
Kabushiki Kaisha Yakult Honsha: *See—*
Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; and Nokata, Kenichiro, 4,399,276, Cl. 542-416.000.

Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; Nokata, Kenichiro; and Hagiwara, Hisao, 4,399,282, Cl. 546-48.000.
Kachik, Robert H.: *See*—
Hamill, Paul E., Jr.; and Kachik, Robert H., 4,398,588, Cl. 164-53.000.
Kackenmeister, Carl F., to GTE Products Corporation. Folded edge seal for flashlamp array. 4,399,491, Cl. 362-11.000.
Kageyama, Junichi: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,399,181, Cl. 428-213.000.
Kahler, Wayne L.: *See*—
Jeromin, Lothar S.; and Kahler, Wayne L., 4,398,818, Cl. 355-10.000.
Kaibel, Gerd: *See*—
Hartmann, Horst; Hochstein, Waldhelm; Kaibel, Gerd; and Mueller, Franz-Josef, 4,399,001, Cl. 203-70.000.
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu. Apparatus for reproducing video signals in a slow-motion operating mode. 4,399,473, Cl. 360-10.300.
Kaiser Steel Corporation: *See*—
Williamson, Calvin C., 4,398,629, Cl. 198-479.000.
Kajioka, Mitsuru; Okawa, Katsumasa; and Taninaka, Kuniaki, to Nikon Nohyaku Co., Ltd. Triazolinone derivative and herbicidal use thereof. 4,398,943, Cl. 71-92.000.
Kajiwara, Seiji: *See*—
Onodera, Toshihiro; Inomata, Koichiro; Hasegawa, Michio; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,399,376, Cl. 307-415.000.
Kakita, Yukio; and Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing system with discharge control. 4,398,614, Cl. 177-25.000.
Kakiuchi, Tsutomu; and Kamon, Yoshiyuki, to Sony Corporation. Speaker unit for headphones. 4,399,334, Cl. 179-180.000.
Kakizaki, Kanichi: *See*—
Ikari, Hirotake; and Kakizaki, Kanichi, 4,398,942, Cl. 71-92.000.
Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.
Kalocai, Andrew J.: *See*—
Allen, Roland M.; and Kalocai, Andrew J., 4,398,989, Cl. 156-500.000.
Kaltenbach, Guy; and Lerner, Pierre, to Societe Anonyme dite: Compagnie Generale d'Electricite. Method of plugging the ends of selected ducts and a paste for use in said method. 4,399,230, Cl. 501-20.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Loge, Hans; and Bareth, Erich, 4,398,885, Cl. 433-126.000.
Kamai, Toshimitsu: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,399,473, Cl. 360-10.300.
Kamiyama, Akira, to Mitsuba Electric Mfg. Co., Ltd. Gasoline resistant commutator. 4,399,383, Cl. 310-233.000.
Kamohara, Eiji: *See*—
Hamano, Eizaburo; Koshigoe, Shinpei; and Kamohara, Eiji, 4,399,388, Cl. 313-414.000.
Kamon, Yoshiyuki: *See*—
Kakiuchi, Tsutomu; and Kamon, Yoshiyuki, 4,399,334, Cl. 179-180.000.
Kanazawa, Mamoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling base contact regions by forming a blocking layer contiguous to a doped poly-si emitter source. 4,398,962, Cl. 148-1.500.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,399,261, Cl. 525-342.000.
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,398,987, Cl. 156-324.000.
Kaneko, Takashi: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,399,181, Cl. 428-213.000.
Kania, Charles M.: *See*—
Das, Suryya K.; and Kania, Charles M., 4,399,254, Cl. 524-745.000.
Kanmoto, Yoshiaki: *See*—
Satomi, Toyokazu; Kanmoto, Yoshiaki; and Tabata, Yasuhiro, 4,399,431, Cl. 340-568.000.
Kano, Masanobu: *See*—
Ishikawa, Hiroshi; Uno, Testuyuki; Kano, Masanobu; and Nakagawa, Kazuyuki, 4,399,134, Cl. 424-246.000.
Kapel, Henry R. Foldable cap construction. 4,398,305, Cl. 2-195.000.
Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Sukhushin, Anatoly V.; Chepurnoi, Nikolai P.; and Cherednikov, Evgeny N., to Kurashiki Boseki Kabushiki Kaisha. Apparatus for sinking wells in the ground. 4,398,609, Cl. 175-19.000.
Karlberg, Bo I.; and Thelander, Sidsel, to Bifok AB. Process and apparatus for flow injection extraction. 4,399,102, Cl. 422-82.000.
Karwat, Heinz: *See*—
Baur, Karl; Lassmann, Eberhard; and Karwat, Heinz, 4,399,111, Cl. 423-226.000.
Kassner, James E.: *See*—
Ambrosiano, Nicholas A.; and Kassner, James E., 4,398,916, Cl. 8-602.000.
Kaswell, Ernest R.: *See*—
Panto, Joseph S.; and Kaswell, Ernest R., 4,398,915, Cl. 8-543.000.
Katagiri, Kazuharu; Watanabe, Katsunori; Ishikawa, Shozo; and Kitahara, Makoto, to Canon Kabushiki Kaisha. Disazo electrophotographic photosensitive member. 4,399,206, Cl. 430-58.000.
Katayama, Keiichi: *See*—
Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,398,328, Cl. 29-126.000.
Kato, Hisaaki: *See*—
Kubota, Nobunori; Kato, Hisaaki; and Nakayama, Teruo, 4,398,320, Cl. 19-236.000.
Kato, Keigo: *See*—
Kuroiwa, Yosio; Kato, Keigo; and Ando, Masahisa, 4,398,522, Cl. 123-549.000.
Kato, Susumu: *See*—
Yoshida, Zenichi; Kato, Susumu; Fujiki, Takuya; and Amemiya, Yasuhiro, 4,399,075, Cl. 260-465.00F.
Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition. 4,399,261, Cl. 525-342.000.
Kato, Yoshiaki, to Nissan Motor Company, Limited. Fluid flow sensor. 4,398,428, Cl. 73-861.050.
Katsuzo, Kamoshita: *See*—
Ichiki, Takemoto; Yoshida, Ryo; Sumida, Seizo; and Katsuzo, Kamoshita, 4,399,072, Cl. 260-453.0RW.
Kaufman, Joseph: *See*—
Nugent, Edward L.; and Kaufman, Joseph, 4,398,544, Cl. 128-763.000.
Kaulfuss, Herbert E. Work-holding clamp with pivotable and slideable clamping screws. 4,398,706, Cl. 269-88.000.
Kavlico Corporation: *See*—
Park, Kyong; and Lee, Chen Y., 4,398,426, Cl. 73-724.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,398,442, Cl. 84-1.170.
Kawanishi, Hideo, to Honeywell Inc. Transverse junction stripe laser with distributed Bragg reflectors. 4,399,542, Cl. 372-47.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hiramatsu, Kinuo, 4,398,741, Cl. 280-283.000.
Kawasaki Steel Corporation: *See*—
Emoto, Kanji; Onishi, Masayuki; Yamada, Hirosuke; Hirayama, Katsuhisa; Ohzu, Hideshi; Ogawa, Masakatsu; and Masuda, Yasuo, 4,398,948, Cl. 75-60.000.
Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, 4,398,699, Cl. 266-50.000.
Kawashima, Kazumi; and Fujita, Masaaki, to Matsushita Electric Industrial Co., Ltd. Signal detector circuit. 4,399,463, Cl. 358-191.100.
Kawashima, Masayoshi; and Yuasa, Akio, to Toyo Seikan Kaisha, Ltd. Molding tool for forming a closure shell liner. 4,398,875, Cl. 425-127.000.
Kay, George; and Keskinen, Alan, to Vacco Industries. Multi-tube flow restrictor. 4,398,563, Cl. 138-42.000.
Kearney, Frank W. Optoelectronic weld travel speed sensor. 4,399,346, Cl. 219-130.010.
Kearney & Trecker Corporation: *See*—
Joerger, John R., 4,398,326, Cl. 29-26.00A.
Keene Corporation: *See*—
Van Dyk, Garritt C., Jr., 4,399,317, Cl. 174-35.0GC.
Keil, Karl-Heinz; May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Fabric softener. 4,399,043, Cl. 252-8.700.
Keller, Karlheinz: *See*—
Boie, Immo; Luhrig, Hermann; Kovacic, Guido; and Keller, Karlheinz, 4,399,212, Cl. 430-404.000.
Kelley Company, Inc.: *See*—
Driear, Joseph R.; and Kovach, Jonathan W., 4,398,315, Cl. 14-71.300.
Kelley, Thomas F.: *See*—
Cormier, Alan D.; Czaban, John D.; Schillinger, Thomas J.; Legg, Kenneth D.; and Kelley, Thomas F., 4,399,362, Cl. 250-430.000.
Kelly, Michael J., to International Telephone & Telegraph Corporation; and International Telephone & Telegraph Corporation. Coaxial cable connector. 4,398,783, Cl. 339-177.00E.
Kelly, Thomas J.; and Nelson, Joseph L., to Huntington Alloys, Inc. Corrosion of type 304 stainless steel by laser surface treatment. 4,398,966, Cl. 148-4.000.
Kelman, Charles D. Apparatus and method for measuring the anterior chamber diameter of the eye. 4,398,812, Cl. 351-205.000.
Kelsey, Paul V., Jr.; and Siegel, William T. Method for fabricating a seal between a ceramic and a metal alloy. 4,398,980, Cl. 156-89.000.
Keltjens, Gerardus M.: *See*—
Haesen, Wilhelmus M. J.; and Keltjens, Gerardus M., 4,398,420, Cl. 73-597.000.
Kelton, Arden A.; Bell, Michael L.; and Chung, Roy A., to Immutron, Inc. Rapid radioimmunoassay product and method of making and using same. 4,399,229, Cl. 436-519.000.
Kemps, Josephus M. A.: *See*—
Proling, Albert; de Jongh, Rudolph O.; and Kemps, Josephus M. A., 4,399,007, Cl. 204-59.00R.
Kennametal Inc.: *See*—
Erickson, Robert A., 4,398,853, Cl. 407-104.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Boden, Karl; and Fremerey, Johan K., 4,398,773, Cl. 308-10.000.
Kerotest Manufacturing Corp.: *See*—
Caroleo, Steven J.; and Schmitt, Edward L., 4,398,754, Cl. 285-45.000.
Kerr, James A.: *See*—
Ruwe, Victor W.; Kerr, James A.; and Sandeau, Rene F., Jr., 4,399,488, Cl. 361-412.000.
Keskinen, Alan: *See*—
Kay, George; and Keskinen, Alan, 4,398,563, Cl. 138-42.000.
Kessler, Donald L. Pole excavating device. 4,398,360, Cl. 37-2.00R.

Key, Anthony N.: *See*—
Rollins, Kay; Key, Anthony N.; and Arlotte, Thomas F., 4,398,615, Cl. 180-127.000.
Keyes, Gary S.: *See*—
Riederer, Stephen J.; Keyes, Gary S.; and Stone, Barry N., 4,399,457, Cl. 358-111.000.
Kibby, Charles L.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,399,234, Cl. 518-715.000.
Kijimuta, Hitoshi: *See*—
Sato, Kimihiko; Terase, Kunihiko; and Kijimuta, Hitoshi, 4,399,115, Cl. 423-344.000.
Kile, Gregory D.; Markham, Larry D.; Cruea, Ronald D.; and Hatton, Derald R., to Black Clawson Company, The. Froth flotation apparatus and method. 4,399,028, Cl. 209-164.000.
Killian, Michael J.: *See*—
Bl'out, Donald E.; Harrison, Marc L.; Killian, Michael J.; and T..erbach, Mark E., 4,399,516, Cl. 364-716.000.
Kimberly-Clark Corporation: *See*—
Eagon, Bevery M., 4,398,985, Cl. 156-233.000.
Kimura, Keiichi: *See*—
Suzuki, Akira; Shioya, Yasumi; and Kimura, Keiichi, 4,398,476, Cl. 110-346.000.
Kimura, Masatoshi: *See*—
Nakajima, Junzo; Kimura, Masatoshi; and Matsuda, Tadashi, 4,398,816, Cl. 355-3.00R.
Kimura, Senkichiro. Force-saving high speed pedal. 4,398,434, Cl. 74-594.400.
Kimura, Shinji: *See*—
Inoue, Yasuhide; Ikezawa, Kenji; and Kimura, Shinji, 4,399,017, Cl. 204-425.000.
Kimura, Yoshiaki: *See*—
Yasufuku, Yoshitaka; Takeuchi, Yoshio; and Kimura, Yoshiaki, 4,399,443, Cl. 346-1.100.
Kinematic Industries, Inc.: *See*—
Spitz, Melvin P., 4,398,311, Cl. 5-13.000.
King, Francis K., to Datapoint Corporation. Suspension assembly for magnetic head. 4,399,476, Cl. 360-104.000.
King, Mildred D. Body related teaching kit. 4,398,891, Cl. 434-159.000.
Kirby, David B.; and Heybey, Otfried W. G., to Whirlpool Corporation. Injection molding method and equipment. 4,399,093, Cl. 264-328.200.
Kiriyama, Tsutomu: *See*—
Sagawa, Yasuhiko; Norota, Susumu; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,399,084, Cl. 264-27.000.
Kirk, Vernon C. Submersible net for helicopter rescue missions. 4,398,760, Cl. 294-77.000.
Kirkham, Steven C.; and Schantz, Ronald K., to Dresser Industries, Inc. Control means for variable displacement pump. 4,398,869, Cl. 417-216.000.
Kishishita, Hiroshi: *See*—
Endo, Yoshihiro; Yamashita, Yoshito; Kishishita, Hiroshi; and Uede, Hisashi, 4,399,015, Cl. 204-192.00P.
Kitahara, Makoto: *See*—
Katagiri, Kazuharu; Watanabe, Katsunori; Ishikawa, Shozo; and Kitahara, Makoto, 4,399,206, Cl. 430-58.000.
Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Kitahara, Makoto, 4,399,207, Cl. 430-58.000.
Kitahara, Toshio: *See*—
Matsuishi, Tsutomu; Maruyama, Hiromasa; Kitahara, Toshio; Kabashima, Akemi; and Toyomasu, Ryuta, 4,399,304, Cl. 562-445.000.
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; and Fujimoto, Hideaki, to Kabushiki Kaisha Kobe Seiko Sho. Method for stably refining high carbon steel. 4,398,949, Cl. 75-60.000.
Kitchen, Cedric A., to Pilkington P.E. Limited. Intruder detection security system. 4,399,430, Cl. 340-550.000.
Kitsuda, Yoshihiro; Ohtsu, Masaaki; and Matsumura, Masahiro, to Matsushita Electric Works, Ltd. Epoxy resin composition. 4,399,257, Cl. 525-118.000.
Kittinger, David L.: *See*—
Jones, Lawrence T.; Howden, Ashley; Knighton, Mark S.; Sims, Anson; Kittinger, David L.; and Hollander, Richard E., 4,398,720, Cl. 273-238.000.
Klaren, Dick G., to Esmil BV. Apparatus for use in carrying out a physical and/or chemical process, for example a heat exchanger. 4,398,594, Cl. 165-104.160.
Kleber, Rolf; and Stuhler, Herbert, to Hoechst Aktiengesellschaft. Sizing agent for synthetic fibers. 4,399,245, Cl. 524-108.000.
Kleemann, Axel; Fahnenstich, Rudolf; and Samson, Marc, to Degussa Aktiengesellschaft. 4-Methylmercapto-2-acetoxy-butyraldehyde. 4,399,302, Cl. 560-266.000.
Klein, Schanzlin & Becker AG: *See*—
Dernedde, Robert; Franke, Hans-Joachim; and Havekost, Peter, 4,398,867, Cl. 415-219.00C.
Kleiner, Fredric; Ramakka, William R.; and Zemelman, Valery B., to General Foods Corporation. Process for preparing gasified ice of improved stability. 4,398,394, Cl. 62-1.000.
Kleininger, Werner: *See*—
Morbitzer, Rudolf; and Kleininger, Werner, 4,398,464, Cl. 101-177.000.
Kleinschmidt, R. Stevens: *See*—
Kleinschmidt, Robert S., Jr., 4,399,397, Cl. 322-8.000.
Kleinschmidt, Robert S., Jr., to Kleinschmidt, R. Stevens, a part interest. Electronic phase shift and speed governor. 4,399,397, Cl. 322-8.000.
Klimowicz, Richard F., to Dresser Industries, Inc. Inversion protection for railroad car coupler. 4,398,641, Cl. 213-109.000.
Kline, Gaylen O.: *See*—
Wisebaker, Robert E.; and Kline, Gaylen O., 4,398,408, Cl. 72-422.000.
Kling, Michael J.; and Marino, Joseph A., to Bear Automotive Service Equipment Company. Engine analyzer with constant width digital waveform display. 4,399,407, Cl. 324-379.000.
Klinner, Wilfred E., to National Research Development Corporation. Crop conditioning apparatus and method. 4,398,384, Cl. 56-14.500.
Klipp, Henry A.: *See*—
Hitchner, John A.; and Klipp, Henry A., 4,398,329, Cl. 29-148.40R.
Kluck, Robert S. Depth displacement squeegee with loading device. 4,398,839, Cl. 401-263.000.
Kluczynski, Achim; and Altmann, Erik, to Agfa-Gevaert Aktiengesellschaft. Externally hooked storage spool for rotary winding on an unwinding. 4,398,679, Cl. 242-74.000.
Kluger, Edward W., to Milliken Research Corporation. Poly-(-2-aminoalkyl)polyamines. 4,399,269, Cl. 528-123.000.
Kluger, Wolfgang; and Huser, Heinz, to Krupp Polysius AG. Pneumatic mixing silo. 4,398,828, Cl. 366-107.000.
Knaack, Donald M.: *See*—
Branchick, Kenneth J.; Malkin, Irving; Sutter, Robert C.; Korinek, Karel A.; Suchanski, Mary R.; Knaack, Donald M.; and Platek, Gary F., 4,399,020, Cl. 204-269.000.
Knighton, Mark S.: *See*—
Jones, Lawrence T.; Howden, Ashley; Knighton, Mark S.; Sims, Anson; Kittinger, David L.; and Hollander, Richard E., 4,398,720, Cl. 273-238.000.
Knowlton, Kenneth C. Representation of designs. 4,398,890, Cl. 434-96.000.
Kobayashi, Masakazu: *See*—
Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, 4,399,278, Cl. 544-022.000.
Kobayashi, Masao. Apparatus for forming soft food material into globular shape. 4,398,881, Cl. 425-235.000.
Kober, Hans-Rudolf: *See*—
Burkhardt, Horst; and Kober, Hans-Rudolf, 4,399,358, Cl. 250-237.00G.
Kobylinski, Thaddeus P.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, Thaddeus P.; and Pannell, Richard B., 4,399,234, Cl. 518-715.000.
Kochloefl, Karl: *See*—
Schneider, Michael; Kochloefl, Karl; Diez, Gerhard; Maier, Franz; Rauch, Josef E.; and Liebelt, Wolfgang, 4,399,350, Cl. 219-388.000.
Kochs Adler AG: *See*—
Scholl, Hans; and Vogt, Siegfried, 4,398,480, Cl. 112-121.120.
Koehn, Richard R.: *See*—
Hanson, David W.; Nash, Richard C.; and Koehn, Richard R., 4,398,761, Cl. 294-81.00R.
Koeppen, Peter L.: *See*—
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,399,331, Cl. 179-5.00R.
Koerfer, Helmut, to F. Vaihinger GmbH & Co. Kommanditgesellschaft. Apparatus for discharging foamed material, such as whipped cream. 4,398,830, Cl. 366-144.000.
Koff, William. Electric heat exchange cooking apparatus. 4,399,351, Cl. 219-433.000.
Kohara, Tadashi: *See*—
Endo, Tetsuhiko; Ueda, Kunihiko; and Kohara, Tadashi, 4,398,386, Cl. 57-288.000.
Kohji, Toda, to TDK Electronics Co., Ltd. Ultrasonic wave transducer. 4,399,387, Cl. 310-334.000.
Kohl, Paul A.: *See*—
Buckley, Reginald R.; D'Asaro, Lucian A.; Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodiuk, Catherine, 4,399,004, Cl. 204-15.000.
Kohno, Yoshihiko: *See*—
Soma, Masafumi; and Kohno, Yoshihiko, 4,399,512, Cl. 364-487.000.
Kohyama, Mitsuaki: *See*—
Nishimura, Fuminobu; and Kohyama, Mitsuaki, 4,398,817, Cl. 355-4.000.
Koike, Isomu, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Small printer. 4,398,461, Cl. 101-99.000.
Koike, Takeshi; and Shibata, Atsushi, to Hitachi, Ltd. Ion implant chamber for ion implantation system. 4,399,365, Cl. 250-492.200.
Koizumi, Shoji: *See*—
Sato, Yuji; and Koizumi, Shoji, 4,399,445, Cl. 346-136.000.
Kojima, Hajime; Kurita, Yukio; Hirata, Kazuhiko; Nakagawa, Satoshi; and Ueoka, Takahira, to Matsushita Electric Works, Ltd. Column-to-beam connector. 4,398,841, Cl. 403-173.000.
Kojima, Shinjiro: *See*—
Nakashima, Kazuyuki; Araki, Youichi; Igarashi, Yukio; and Kojima, Shinjiro, 4,399,452, Cl. 357-74.000.
Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; Honda, Yukio; and Kojima, Tetsuhiko, 4,399,298, Cl. 560-59.000.
Kolesar, Henry R., to Ocenco Incorporated. Incandescent and fluorescent caplight device. 4,399,492, Cl. 362-106.000.

Kolonics, Zoltan: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Komatsu, Masaaki: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,399,473, Cl. 360-10.300.

Komauer, Christian; and Mayer, Andreas, to BBC Brown, Boveri & Company Limited. Control apparatus for a gas dynamic pressure-wave machine for charging combustion engines. 4,398,868, Cl. 417-64.000.

Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi: *See*—
Suovaniemi, Osmo A.; Tervamaki, Jukka; Suni, Jukka; and Partanen, Paul, 4,398,382, Cl. 53-431.000.

Komyoji, Terumasa: *See*—
Yokomichi, Isao; Haga, Takahiro; Komyoji, Terumasa; Nakajima, Toshio; and Matsuo, Norifusa, 4,399,143, Cl. 424-263.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Flux control device. 4,398,554, Cl. 137-91.000.

Kondo, Syunichi; Matsufuji, Akihiro; Umehara, Akira; Ukai, Toshinao; and Sato, Akira, to Fuji Photo Film Co., Ltd. Photopolymerizable compositions. 4,399,211, Cl. 430-269.000.

Konishi, Yoshitaka: *See*—
Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohisa; and Ito, Hiroyuki, 4,399,147, Cl. 424-285.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,399,213, Cl. 430-523.000.
Yasufuku, Yoshitaka; Takeuchi, Yoshio; and Kimura, Yoshiaki, 4,399,443, Cl. 346-1.100.

Kopko, John J., to Xerox Corporation. Multi-roll development system. 4,398,496, Cl. 118-658.000.

Koppen, Johannes E. A.; and Workman, Samuel E., to Du Pont de Nemours, E. I., and Company. Transfer tail winding device for tandem windups. 4,398,676, Cl. 242-18.00A.

Koppers Company, Inc.: *See*—
Greco, Nicholas P., 4,399,310, Cl. 568-346.000.

Korinek, Karel A.: *See*—
Branchick, Kenneth J.; Malkin, Irving; Sutter, Robert C.; Korinek, Karel A.; Suchanski, Mary R.; Knaack, Donald M.; and Platek, Gary F., 4,399,020, Cl. 204-269.000.

Koronkiewicz, Henry L. Locking animal collar. 4,398,500, Cl. 119-109.000.

Koshigoe, Shinpei: *See*—
Hamano, Eizaburo; Koshigoe, Shinpei; and Kamohara, Eiji, 4,399,388, Cl. 313-414.000.

Kosior, Stefan: *See*—
Druke, Michael B.; Feaver, Richard L.; and Kosior, Stefan, 4,399,505, Cl. 364-200.000.

Kotecha, Harish N., to International Business Machines Corporation. Non-volatile static RAM cell with enhanced conduction insulators. 4,399,522, Cl. 365-185.000.

Kovach, Bruce F. Precision tuning pin for pianos. 4,398,443, Cl. 84-201.000.

Kovach, Jonathan W.: *See*—
Driear, Joseph R.; and Kovach, Jonathan W., 4,398,315, Cl. 14-71.300.

Kovacic, Guido: *See*—
Boie, Immo; Luhrig, Hermann; Kovacic, Guido; and Keller, Karl-heinz, 4,399,212, Cl. 430-404.000.

Kovacs, Miklos: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Kovalevich, Edward W. Duct work clip installer and crimper. 4,398,334, Cl. 29-243.500.

Kovats, Tibor F. I.; Devenyi, Tibor F.; and Look, Christopher M., to Northern Telecom Limited. Light emitting device package having combined heater/cooler. 4,399,541, Cl. 372-36.000.

Kowitz, Friedrich: *See*—
Humme, Gert; Plato, Horst; Ott, Karl-Heinz; Kowitz, Friedrich; and Hagenberg, Peter, 4,399,273, Cl. 528-486.000.

Koyama, Koichiro; and Shimotake, Hiroshi. Method of boronizing transition metal surfaces. 4,398,968, Cl. 148-6.110.

Koyama, Shinji: *See*—
Kitamura, Minoru; Koyama, Shinji; Ito, Shuzo; Ohgami, Masahiko; and Fujimoto, Hideaki, 4,398,949, Cl. 75-60.000.

Koyanagi, Katubumi: *See*—
Hamada, Hiroshi; Yano, Kohzo; Koyanagi, Katubumi; Take, Hiroshi; and Inami, Yasuhiko, 4,399,436, Cl. 340-812.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Becker, Manfred; Melchior, Klaus; and Slegers, Leonhard, 4,399,082, Cl. 261-124.000.

Krajicek, Richard W.; and Sperry, John S., to Carmel Energy, Inc. Method and apparatus for producing a high pressure thermal vapor stream. 4,398,604, Cl. 166-303.000.

Kramer, Erich, to Bayer Aktiengesellschaft. Concentrated, aqueous solutions of salts of acetoacetylamino-arylsulphonic acids and method of forming concentrated solutions of azo dyestuffs therefrom. 4,399,068, Cl. 260-158.000.

Kraus, Charles E., to Excelermatic Inc. Ball bearing. 4,398,778, Cl. 308-235.000.

Krause, Johannes: *See*—
Diskowski, Herbert; Krause, Johannes; and Mandelkow, Dietrich, 4,399,037, Cl. 210-721.000.

Krawczak, John A.; and Torok, Ernest J., to Sperry Corporation. Image rotating diffraction grating. 4,398,798, Cl. 350-162.240.

Kreid, Ferdinand. Apparatus for the forming, shaping and cutting of contact leads of electronic components. 4,398,573, Cl. 140-105.000.

Kreidl, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.

Krejcar, Jan A.: *See*—
Argibay, John, Jr.; and Krejcar, Jan A., 4,398,716, Cl. 273-29.00A.

Kretschmann, Robert J.: *See*—
Siegmund, Gary G.; and Kretschmann, Robert J., 4,399,410, Cl. 328-55.000.

Krikorian, Oscar H.; Grens, John Z.; and Parrish, William H., Sr. Method for reprocessing and separating spent nuclear fuels. 4,399,108, Cl. 423-5.000.

Kroes, Johannes A.: *See*—
van Laar, Jacobus; Vander, Timen; Kroes, Johannes A.; and Brooersen, Pieter G., 4,398,999, Cl. 202-267.00R.

Kron, Martin W.; and Polz, Victor I., to Eastman Kodak Company. Variable-width web slitting and winding apparatus. 4,398,678, Cl. 242-56.300.

Krumm, Heinz-Gerhard; and Neugart, Horst, to Vorwerk & Co. Interholding GmbH. Filter for cooling air stream of electric commutator motor for household device. 4,399,378, Cl. 310-56.000.

Kruper, Wayne A.; and Green, Ralph R., to Imperial Clevite Inc. Ultra-high current density electroplating cell. 4,399,019, Cl. 204-212.000.

Krupp Polysius AG: *See*—
Kluger, Wolfgang; and Huser, Heinz, 4,398,828, Cl. 366-107.000.

Kubota Ltd.: *See*—
Shimoie, Shizuo, 4,398,861, Cl. 414-694.000.

Kubota, Masaharu; and Kurihara, Toshiro, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Air-fuel ratio control system. 4,398,517, Cl. 123-440.000.

Kubota, Nobunori; Kato, Hisaaki; and Nakayama, Teruo, to Murata Kikai Kabushiki Kaisha. Method and apparatus for transmitting driving power in drafting device of spinning frame. 4,398,320, Cl. 19-236.000.

Kuenzel, Roland, to Siemens Aktiengesellschaft. Communications system, in particular a telephone system, for connecting mobile subscriber terminal devices. 4,399,330, Cl. 179-2.0EB.

Kuhni, Heinz; and Schwaninger, Peter, to Ivers-Lee AG. Apparatus for sealing a lamina onto a plastic bag. 4,398,990, Cl. 156-510.000.

Kulcsar, Taszlo: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Kulier, Charles P.: *See*—
Fisher, James R.; and Kulier, Charles P., 4,399,283, Cl. 546-106.000.

Kullander, Gregor H.; Chatfield, Christopher G.; Mikus, Marian; and Westergren, Bo K., to Santrade Ltd. Method of preparing coated cemented carbide product. 4,399,168, Cl. 427-255.700.

Kummermehr, Hans; and Mohr, Gunther, to Grunzweig + Hartmann und Glasfaser AG. Heat-insulating body. 4,399,175, Cl. 428-76.000.

Kumpfer, Beverly D. Microwave food dispensing machine. 4,398,651, Cl. 221-6.000.

Kunieda, Toshiaki: *See*—
Sugita, Ryuji; and Kunieda, Toshiaki, 4,399,013, Cl. 204-192.00N.

Kunkler, Walter F.: *See*—
Crandall, Norma M.; Doyle, Raymond H.; and Kunkler, Walter F., 4,399,340, Cl. 200-334.000.

Kunsagi, Laszlo, to Foster Wheeler Energy Corporation. Electrogasdynamically assisted cyclone system for cleaning flue gases at high temperatures and pressures. 4,398,928, Cl. 55-107.000.

Kunz, Raymond W.: *See*—
Deming, Loretta M.; and Kunz, Raymond W., 4,399,349, Cl. 219-276.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Thread brake for creels. 4,398,681, Cl. 242-150.00R.

Kuramoto, Hiroyoshi: *See*—
Imamura, Shinzo; Sato, Haruyo; and Kuramoto, Hiroyoshi, 4,399,289, Cl. 548-507.000.

Kurandt, Hans-Friedrich, to Chemische Werke Huls Aktiengesellschaft. Process for reducing the radioactivity of calcium sulfate prepared from phosphate rock. 4,399,110, Cl. 423-167.000.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Sukhushin, Anatoly V.; Chepurnoi, Nikolai P.; and Cherednikov, Evgeny N., 4,398,609, Cl. 175-19.000.

Kurashina, Kozo: *See*—
Yamamoto, Katsuhiko; Yamamitsu, Chojuro; Sekimoto, Kunio; and Kurashina, Kozo, 4,399,472, Cl. 358-320.000.

Kurata, Keiji: *See*—
Ohsawa, Kenji; Ito, Takao; Tanno, Koichiro; Ohsawa, Masayuki; and Kurata, Keiji, 4,398,975, Cl. 148-400.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Arabori, Hideo; Satake, Keigo; and Shinkawa, Hiroyasu, 4,398,944, Cl. 71-118.000.

Kurihara, Toshiro: *See*—
Kubota, Masaharu; and Kurihara, Toshiro, 4,398,517, Cl. 123-440.000.
Kurita, Toshiaki: *See*—
Nishimiya, Toru; and Kurita, Toshiaki, 4,398,719, Cl. 273-138.00R.
Kurita, Yoshihiko; and Uchida, Naotaka, to Nihon Dennetsu Co., Ltd. Illuminated artificial flower ornament. 4,399,493, Cl. 362-122.000.
Kurita, Yukio: *See*—
Kojima, Hajime; Kurita, Yukio; Hirata, Kazuhiko; Nakagawa, Satoshi; and Ueoka, Takahira, 4,398,841, Cl. 403-173.000.
Kuroiwa, Yosio; Kato, Keigo; and Ando, Masahisa, to Toyota Jidosha Kabushiki Kaisha. Intake heating device of an internal combustion engine. 4,398,522, Cl. 123-549.000.
Kurtz, Stuart J.: *See*—
Anthony, John; and Kurtz, Stuart J., 4,399,173, Cl. 428-35.000.
Kutemeier, Hans-Dieter, to FAG Kugelfischer Georg Schafer & Co. Roller bearing with annular retaining disks. 4,398,776, Cl. 308-207.00R.
Kutschera, Peter: *See*—
Blum, Adolf; Kutschera, Peter; and Vogl, Guenther, 4,398,914, Cl. 8-456.000.
Kuttruf, Werner: *See*—
Schulze, Eckehart; and Kuttruf, Werner, 4,398,657, Cl. 226-11.000.
KV33 Corporation: *See*—
Huffman, Ronald E., 4,398,884, Cl. 433-74.000.
Kwasnik, Andrew F., Jr., to Combustion Engineering, Inc. Steam generating heat exchanger. 4,398,504, Cl. 122-468.000.
La Telephonie Industrielle et Commerciale: *See*—
Demange, Jean-Pierre; and Lagarde, Pierre, 4,399,530, Cl. 370-31.000.
Labaig, Jean-Jacques: *See*—
Claude, Bruno; Pellerin, Daniel; and Labaig, Jean-Jacques, 4,398,644, Cl. 215-232.000.
La Bate, Micheal D. Material for treating coke oven doors and jambs to prevent the build up of tar thereon. 4,399,250, Cl. 524-442.000.
Labbe, Thomas V., to Combustion Engineering, Inc. Primary manway cover removal. 4,398,649, Cl. 220-327.000.
Laboratoires Goella: *See*—
Holmquist, Leif T.; and Carlson, Lars A., 4,399,217, Cl. 435-7.000.
LaFever, Clifford E., to United States of America, Army. Buffered bolt assembly. 4,398,448, Cl. 89-185.000.
Lagarde, Pierre: *See*—
Demange, Jean-Pierre; and Lagarde, Pierre, 4,399,530, Cl. 370-31.000.
Laker, Kenneth R.: *See*—
Ballantyne, James P.; Fleischer, Paul E.; Laker, Kenneth R.; and Yiannoulos, Aristides A., 4,399,417, Cl. 330-109.000.
Lakhani, Kishor M.; and Ligon, Jerry L., to Honeywell Information Systems Inc. Wear resistant electrode head for electrographic printers. 4,399,447, Cl. 346-155.000.
Lam, Wilhelmus J.; and de Vries, Luitzen, to Fokker B.V. Flight simulator. 4,398,889, Cl. 434-45.000.
Lamba Physik Gesellschaft zur Herstellung von Lasern mbH & Co. KG: *See*—
Bucher, Hermann, 4,399,540, Cl. 372-20.000.
Lambros, Emanuel E.; and Wolfston, James H. Aesthetic whistling coffeepot. 4,398,454, Cl. 99-285.000.
Lang, Gunter: *See*—
Gauhl, Helmgard; Seidel, Hans; Lang, Gunter; Roder, Albert; and Ziegenhorn, Joachim, 4,399,218, Cl. 435-25.000.
Lange International S.A.: *See*—
Chalmers, Edward L., II, 4,398,359, Cl. 36-117.000.
Langston, Chandos E., Jr., to United Technologies Corporation. High bypass ratio suppiemental fuel injection. 4,398,388, Cl. 60-241.000.
Lanier Business Products, Inc.: *See*—
Titus, Theodore, IV; and Bagley, Julius B., 4,399,527, Cl. 369-28.000.
Lapham, Jerome F.; and Clark, Tommy D., to Analog Devices, Inc. Laser trimming of circuit elements on semiconductive substrates. 4,399,345, Cl. 219-121.0LJ.
Laporte, Alain, to Renix Electronique S.A. Electronic adapter for a diagnostic pickup of data supplied by an electronic control circuit. 4,399,429, Cl. 340-507.000.
Larrose, Philippe J.: *See*—
Clin, Francois H.; Gony, Jean-Noel M.; Proust, Francois O.; Cuvillier, Roger O.; and Larrose, Philippe J., 4,399,029, Cl. 209-234.000.
Larson, Larry A.; and Murphy, Brian J., to Caterpillar Tractor Co. Fluid deaeration apparatus. 4,398,930, Cl. 55-192.000.
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Lauro, Fernand; Manon, Bernard; and Marie, Gerard, to Commissariat a l'Energie Atomique. Plate-type heat exchangers. 4,398,596, Cl. 165-167.000.
Lawson, John E., to Mead Johnson & Company. Antiarrhythmic phenethylpiperidine compounds. 4,399,286, Cl. 546-231.000.
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Layman, Frank D., Sr. Self-feeding appliance. 4,398,857, Cl. 414-9.000.
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Sitek, George J., 4,398,836, Cl. 374-38.000.
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Park, Kyong; and Lee, Chen Y., 4,398,426, Cl. 73-724.000.
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Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased, 4,399,158, Cl. 426-112.000.
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Lehmacher, Hans. Method of and apparatus for making handle bags. 4,398,903, Cl. 493-197.000.
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Lehrer, William I., to Fairchild Camera & Instrument Corporation. Multilayer metal silicide interconnections for integrated circuits. 4,398,335, Cl. 29-577.00C.
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Bennett, Keith E.; and Byer, Robert L., 4,398,806, Cl. 350-394.000.
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Lengacher, Eli. Battery powered lamp device. 4,399,496, Cl. 362-203.000.
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Steiner, Gerd; Gries, Josef; and Lenke, Dieter, 4,399,137, Cl. 424-250.000.
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Leopoldi, Norbert; and Heinrich, William P., to Cloverline, Inc. Flashlight. 4,399,495, Cl. 362-189.000.
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Levinson, Solomon; and Reilly, William, to Centre Engineering, Inc. Method for destructive testing of dielectric ceramic capacitors. 4,399,401, Cl. 324-51.000.

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Lewis, Robert W., to General Motors Corporation. Optical scanner for ball inspection. 4,398,825, Cl. 356-426.000.

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Williams, Arthur L., 4,398,688, Cl. 244-207.000.
Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., 4,399,100, Cl. 422-62.000.

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Lohstroh, Jan, to U.S. Philips Corporation. ROM With poly-Si to mono-Si diodes. 4,399,450, Cl. 357-59.000.

Lomax, Donald P.; and Boggs, Ronald M. Lining alloy for bimetallic cylinders. 4,399,198, Cl. 428-595.000.

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Fleenor, Jonathan T.; Long, George W., Jr.; and Dawson, John M., 4,398,872, Cl. 417-360.000.

Long, Olen R.: *See*—
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Look, Christopher M.: *See*—
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Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,399,153, Cl. 426-5.000.

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Lowe, Charles L., to Grayson, Jacob H. Method and apparatus for generating vapor of a volatile liquid fuel and operating an internal combustion engine therewith. 4,399,079, Cl. 261-36.00A.

Lowery, Kirby, Jr.: *See*—
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Lucherini, Guido. Sealed-type D.C. electric motor having reduced diametrical bulk. 4,399,384, Cl. 310-241.000.

Ludman, Jacques E.: *See*—
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Lueth, Roy C., to Ultra-Temp Corporation. Metallurgical furnace. 4,398,702, Cl. 266-208.000.

Luhrig, Hermann: *See*—
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Lunn, David J. Audio signaling device and method. 4,399,432, Cl. 340-573.000.

Lunn, Gerald K.; and McGinn, Michael, to Motorola, Inc. Variable capacitance circuit. 4,399,561, Cl. 455-266.000.

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M.A.N. Maschinenfabrik Augsburg-Nurnberg: *See*—
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MacDonald, Verne H.; Porter, Philip T.; and Young, W. Rae, to Bell Telephone Laboratories, Incorporated. Cellular high capacity mobile radiotelephone system with fleet-calling arrangement for dispatch service. 4,399,555, Cl. 455-33.000.

Macfie, James P. Utility device for suspending sheet-like material. 4,398,692, Cl. 248-309.00R.

MacGregor, John S. Electrical friction sleeve cone penetrometer. 4,398,414, Cl. 73-84.000.

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Maciaszek, Adalbert: *See*—
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Mackay, Donald A. M.: *See*—
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MacLean, Alexander, to Electro Switch Corp. Lock-out relay with adjustable trip coil. 4,399,421, Cl. 335-174.000.

Maegawa, Muneo, to Hitachi, Ltd. Rotary shaft water seal device in hydraulic machine. 4,398,725, Cl. 277-192.000.

Maestrello, Lucio, to United States of America, National Aeronautics and Space Administration. Apparatus and method for jet noise suppression. 4,398,667, Cl. 239-265.170.

Magno, Robert: *See*—
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Magnussen, Haakon T., Jr.: *See—*
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Maine, Arthur E., to Aviation Electric Ltd. Compensated magnetic sensor for use on highly magnetized vehicles. 4,398,352, Cl. 33-356.000.
Maire, Aurele; Michel, Jean-Georges; and Robert-Grandpierre, Jean-Claude, to Compagnie des Montres Longines Francillon SA. Multifunction timepiece. 4,398,832, Cl. 368-76.000.
Maiwa, Hisaaki: *See—*
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Malwah, Manohar L., to Signetics Corporation. Method of forming ion implants self-aligned with a cut. 4,398,964, Cl. 148-1.500.
Malyuk, John. High speed power sander and sanding pad therefor. 4,398,375, Cl. 51-170.0TL.
Mancuso, Paul, to Fiberlux Products, Inc. Vinyl frame, multi-panel, sliding door assembly. 4,398,373, Cl. 49-425.000.
Mandelkow, Dietrich: *See—*
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Manente, Joseph C., Jr.: *See—*
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Manera, Maxime: *See—*
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Mangum, Robert J., to Weyerhaeuser Company. Method of making container with hinged cover. 4,398,902, Cl. 493-102.000.
Manning, Maurice; and Sawyer, Wilbur H. Novel antagonists of the antidiuretic action of arginine vasopressin. 4,399,125, Cl. 424-177.000.
Manola, Alvin J. Litter pick up device. 4,398,759, Cl. 294-1.0BA.
Manon, Bernard: *See—*
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Manuccia, Thomas J., Jr.: *See—*
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Marder, Arnold R.; and Bramfitt, Bruce L., to Bethlehem Steel Corporation. Titanium and vanadium dual-phase steel and method of manufacture. 4,398,970, Cl. 148-12.00F.
Marie, Gerard: *See—*
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Marks, Stephen W.; Wooten, Gary D.; and Gray, Ronald N., to General Motors Corporation. Air cooled machine and cooling fan. 4,399,379, Cl. 310-62.000.
Marlow, Richard A. Thermally efficient window shade construction. 4,398,585, Cl. 160-23.00R.
Marmet, Melvin L., to Rockwell International Corporation. FET Power supply for MOS memories. 4,399,373, Cl. 307-296.00R.
Marmon Group, Inc., The: *See—*
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Marschner, Jamie J.; and Maxon, Rodney R., to Western Electric Company, Inc. Methods of and systems for monitoring a first call connection while effecting the establishment of a second call connection. 4,399,532, Cl. 370-62.000.
Marshall, Keith G.: *See—*
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Mason, Richard R. Method for removing paint with air stream heated by hot gas. 4,398,961, Cl. 134-19.000.
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Masselin, Michel, to Alsthom-Atlantique. Set of power semiconductors equipped with firing transformers and with protection circuits. 4,399,501, Cl. 363-141.000.
Massmann, Volker, to Robert Bosch GmbH. System for scanning of motion picture films to derive television signals. 4,399,465, Cl. 358-214.000.
Masubuchi, Hitoshi: *See—*
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Masuda, Hajime, to Nippon Electric Co., Ltd. Monolithic integrated circuit. 4,399,521, Cl. 365-180.000.
Masuda, Hiroo; and Shimohigashi, Katsuhiro, to Hitachi, Ltd. Dynamic monolithic memory. 4,399,519, Cl. 365-149.000.
Masuda, Yasuo: *See—*
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Mathieu, Kenneth G. Removable canoe-carried cooler. 4,398,488, Cl. 114-343.000.
Matkan, Josef, to Coulter Systems Corporation. Liquid electrophotographic toner applicator. 4,398,497, Cl. 118-661.000.
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Snyder, Michael D.; Dean, Weibley J.; Merithew, David L.; Ragard, Philip A.; and Matson, Crawford A., 4,398,658, Cl. 227-46.000.
Matsuda, Tadashi: *See—*
Nakajima, Junzo; Kimura, Masatoshi; and Matsuda, Tadashi, 4,398,816, Cl. 355-3.00R.
Matsuda, Toshio: *See—*
Ueno, Ryuzo; Matsuda, Toshio; and Inamine, Shigeo, 4,399,150, Cl. 424-317.000.
Matsuda, Youichi: *See—*
Fujitani, Shigeo; and Matsuda, Youichi, 4,399,094, Cl. 264-566.000.
Matsufuji, Akihiro: *See—*
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Kitsuda, Yoshihiro; Ohtsu, Masaaki; and Matsumura, Masahiro, 4,399,257, Cl. 525-118.000.
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Matsuoka, Paul S.: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Kawashima, Kazumi; and Fujita, Masaaki, 4,399,463, Cl. 358-191.100.
Sugita, Ryuji; and Kunieda, Toshiaki, 4,399,013, Cl. 204-192.00N.
Ueda, Shigeki, 4,399,352, Cl. 219-506.000.

Yamamoto, Katsuhiko; Yamamitsu, Chojuro; Sekimoto, Kunio; and Kurashina, Kozo, 4,399,472, Cl. 358-320.000.
Matsushita Electric Works, Ltd.: *See*—
Kitsuda, Yoshihiro; Ohtsu, Masaaki; and Matsumura, Masahiro, 4,399,257, Cl. 525-118.000.
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Fukuda, Masahito; Tanabe, Akiyoshi; Moriguchi, Yasuo; Nagai, Nobuyuki; Tsuji, Kunio; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Mizuta, Atsuo, 4,398,406, Cl. 72-42.000.
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Matsuzaki, Kazuhiko: *See*—
Sakurai, Hisaya; Hamada, Minoru; Matsuzaki, Kazuhiko; and Aminaka, Muneaki, 4,399,272, Cl. 528-233.000.
Matzuk, Terrance, to Dymax Corporation. Ultrasonic scanning transducer. 4,398,425, Cl. 73-633.000.
Maurer, Alexander; Heymer, Gero; and Erpenbach, Markus, to Hoechst Aktiengesellschaft. Process for the dearsenification of polyphosphoric acid. 4,399,114, Cl. 423-321.00R.
Maurer, Fritz: *See*—
Forster, Heinz; Hofer, Wolfgang; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,399,285, Cl. 546-210.000.
Maxey, William C.: *See*—
Bryan, Donald A.; and Maxey, William C., 4,398,439, Cl. 83-356.300.
Maxon, Rodney R.: *See*—
Marschner, Jamie J.; and Maxon, Rodney R., 4,399,532, Cl. 370-62.000.
May, Adolf: *See*—
Keil, Karl-Heinz; May, Adolf; and Bucking, Hans-Walter, 4,399,043, Cl. 252-8.700.
May, Max; Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Tanning method. 4,398,911, Cl. 8-94.160.
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Komauer, Christian; and Mayer, Andreas, 4,398,868, Cl. 417-64.000.
Mayer, Arnold H., to United States of America, Air Force. Integral electric module and assembly jet cooling system. 4,399,484, Cl. 361-382.000.
MCC Flowseal: *See*—
Torche, Michael P., 4,398,695, Cl. 251-306.000.
McCadden, Walter E. Dispensing apparatus for tissue rolls. 4,398,656, Cl. 225-47.000.
McCann, James D.; Williams, Theodore F.; and Vogel, John D., to Mead Corporation, The. Ink supply system for an ink jet printer. 4,399,446, Cl. 346-140.00R.
McCann, Peter P.: *See*—
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McClosky, Robert B., to Wrapade Machine Company, Inc. Child-proof package system. 4,398,634, Cl. 206-532.000.
McClure, John C., to Dow Chemical Company, The. Separation of a 2-oxazoline from an aqueous solution. 4,399,288, Cl. 548-239.000.
McClure, Richard J.: *See*—
French, William W.; Lemke, James U.; and McClure, Richard J., 4,398,345, Cl. 29-603.000.
McCord, Dick P.: *See*—
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McCurry, Walter W.; and Pettit, Walter G. Braking system for towed vehicles. 4,398,771, Cl. 303-15.000.
McDaniel, Thomas I. Self-steering and retractable axle assembly. 4,398,738, Cl. 280-81.00R.
McGill, Ian R.; and Selman, Gordon L., to Johnson, Matthey & Co., Limited. Protective layer. 4,399,199, Cl. 428-633.000.
McGinn, Michael: *See*—
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McGlen, James A.: *See*—
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McGowan, Paul J. Insulative end cap for cylindrical metal drying rollers of paper drying machines, and process for fabrication thereof. 4,399,169, Cl. 427-284.000.
McGuigan, Richard M. Patio swing. 4,398,767, Cl. 297-280.000.
McKay, Ruth B. Nutrition education game. 4,398,721, Cl. 273-249.000.
McKenzie, Ross A.; and Busch, Hans, to National Rubber Company, Limited. Splash guard. 4,398,739, Cl. 280-154.50R.
McKiel, Charles W., Jr., to SSK Corporation. Hazardous waste incineration system. 4,398,475, Cl. 110-346.000.
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McLoughlin, Robert W.: *See*—
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McNamara, John M.: *See*—
Schuurman, Eiko A., 4,398,521, Cl. 123-527.000.
McWhorter, Fred A.; and Harmon, Samuel R., to Bee Line Company. Automotive frame and body correcting equipment. 4,398,410, Cl. 72-457.000.
McWilliams, Roy A.; and von Holle, William G. Detonator-activated ball shutter. 4,398,801, Cl. 350-275.000.
Mead Corporation, The: *See*—
Baxter, Ronald A., 4,398,636, Cl. 206-614.000.
McCann, James D.; Williams, Theodore F.; and Vogel, John D., 4,399,446, Cl. 346-140.00R.
Odell, Richard, 4,398,772, Cl. 308-4.00A.
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,399,209, Cl. 430-138.000.
Stolfo, John J., 4,398,954, Cl. 106-21.000.
Mead Johnson & Company: *See*—
Lawson, John E., 4,399,286, Cl. 546-231.000.
Meadows, Roger D., to Dayco Corporation. Center plate structure for railway vehicle. 4,398,330, Cl. 29-149.50C.
Meckel, Benjamin B., to Eastman Kodak Company. Thin film magnetic head having good low frequency response. 4,399,479, Cl. 360-126.000.
Mecklenburg, Alfred C.: *See*—
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Medtronic, Inc.: *See*—
Holmbo, Dwight N., 4,398,537, Cl. 128-420.00R.
Rao, T. V., 4,398,413, Cl. 73-40.700.
Underhill, Lloyd J.; and Helgeson, William D., 4,398,346, Cl. 29-623.500.
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Melin, Thomas N.: *See*—
Aikins, Warren A.; and Melin, Thomas N., 4,398,581, Cl. 144-366.000.
Melnick, Harry S. Mechanical power transmitting system. 4,398,431, Cl. 74-61.000.
Melton, Keith; Mercier, Olivier; and Riegger, Helmut, to BBC Brown, Boveri & Company, Limited. Shape-memory alloy based on copper, zinc and aluminum and process for preparing it. 4,398,969, Cl. 148-11.50C.
Mendenhall, Robert L. Asphaltic concrete recycling apparatus. 4,398,826, Cl. 366-25.000.
Menick, Douglas B. Compact, portable locking mechanism. 4,398,403, Cl. 70-58.000.
Mercier, Olivier: *See*—
Melton, Keith; Mercier, Olivier; and Riegger, Helmut, 4,398,969, Cl. 148-11.50C.
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Merwarth, Richard J., to Harris Corporation. Stacker-tyer. 4,398,455, Cl. 100-7.000.
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Sepp, Gunther; Diehl, Christian; Bogenberger, Richard; Born, Gunthard; Mohr, Friedbert; Schmidt, Roland; Schnaebele, Werner; and Thalmair, Korbinian, 4,398,466, Cl. 102-427.000.
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Fennemann, Wolfgang, 4,399,118, Cl. 423-489.000.
Metz, Reinhard, to Bell Telephone Laboratories, Incorporated. Convolution filter arrangement for digital multifrequency receiver. 4,399,536, Cl. 370-110.300.
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Micro Pure Systems, Inc.: *See*—
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Midland-Ross Corporation: *See*—
Thome, William L., 4,398,700, Cl. 266-111.000.
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Mihlbachler, Carl B.: *See*—
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Mikami, Yoshiharu; Sashiki, Takashi; and Asai, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Automatic weighing apparatus. 4,398,612, Cl. 177-25.000.
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Miles Laboratories, Inc.: *See*—
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Milford, George N., Jr., to Du Pont de Nemours, E. I., and Company; and Du Pont de Nemours, E. I., and Company. Preparation and use of nitroterephthalamic acids. 4,399,303, Cl. 562-437.000.
Miller, Anthony Z.: *See*—
Pampalone, Thomas R.; and Miller, Anthony Z., 4,398,660, Cl. 228-175.000.
Miller, Jan D., to University of Utah Research Foundation. Flotation apparatus and method for achieving flotation in a centrifugal field. 4,399,027, Cl. 209-164.000.
Milligan, John D., to HRI, Inc. Process and apparatus for adding and removing particles from pressurized reactors. 4,398,852, Cl. 406-47.000.
Milliken Research Corporation: *See*—
Kluger, Edward W., 4,399,269, Cl. 528-123.000.
Minami, Satoyuki; Nagata, Ryuichi; and Otaki, Toshihiro, to Toray Industries, Inc. Polyester laminated film. 4,399,179, Cl. 428-212.000.
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Minnesota Mining and Manufacturing Company: *See*—
Danielson, Richard D.; and Prokop, Robert A., 4,399,226, Cl. 436-56.000.
Shevlin, Thomas S., 4,398,931, Cl. 55-341.00R.
Minuskin, Harold: *See*—
Rockwell, Kenneth N.; and Minuskin, Harold, 4,399,400, Cl. 324-51.000.
Mischiatti, Mario, to Costruzioni Meccaniche F.B.M.S.p.A.; and Teksid S.p.A. System for recovering latent and sensible heat of effluent gases from a melting installation. 4,398,501, Cl. 122-7.00R.
Miskin, Richard B. Earth moving scraper. 4,398,363, Cl. 37-129.000.
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Iwabuchi, Tadashi; and Hayashi, Osamu, 4,399,191, Cl. 428-336.000.
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Yoshinaka, Shigeo; Toki, Tsukasa; Wakatsuki, Misuzu; and Uchiyama, Seiji, 4,399,311, Cl. 568-437.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,398,876, Cl. 425-143.000.
Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,398,328, Cl. 29-126.000.
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Mitsubishi Petrochemical Company Limited: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,398,753, Cl. 282-27.500.
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Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; and Nokata, Kenichiro, to Kabushiki Kaisha Yakult Honsha. 7-Substituted camptothecin derivatives. 4,399,276, Cl. 542-416.000.
Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; Nokata, Kenichiro; and Hagiwara, Hisao, to Kabushiki Kaisha Yakult Honsha. Camptothecin derivatives. 4,399,282, Cl. 546-48.000.
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Mizuno, Sakuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Printer. 4,399,468, Cl. 358-280.000.
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Briggs, William F.; and Bullard, Edward M., 4,399,180, Cl. 428-212.000.
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Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, to Central Glass Company, Limited. Method of producing glazed ceramic substrate. 4,399,089, Cl. 264-57.000.
Moll, Thorleif, to Cinderella AB. Conduit device. 4,398,567, Cl. 138-113.000.
Moller, Bengt A. K. Liquid filtering apparatus. 4,399,034, Cl. 210-268.000.
Momoyama, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control system for internal combustion engine. 4,398,516, Cl. 123-418.000.
Monaghan, George J., to Energy Fibers Int'l. Corp. High temperature electronic furnace apparatus and methods of operation. 4,399,544, Cl. 373-35.000.
Monsanto Company: *See*—
D'Amico, John J., 4,398,940, Cl. 71-90.000.
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Moon, Charles L.; and Cieszko, Joseph T., to Volvo White Truck Corporation. Engine cooling fan construction. 4,398,508, Cl. 123-41.490.
Moore, Herbert E.; and Flanders, Thomas E., to General Electric Co. Receiver of pulsed phase modulated signals. 4,399,547, Cl. 375-83.000.
Moore, Ira V. Method for inflating dual pneumatic tires. 4,398,574, Cl. 141-1.000.
Moore, Kenneth A.: *See*—
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Moorehead, Robert M., to Comar, Inc. Hydraulic surface cleaning apparatus. 4,398,551, Cl. 134-104.000.

Moran, James S.; and Groezinger, Marlo W., to Highland Agro Inc. Portable dock. 4,398,849, Cl. 405-221.000.

Morbitzer, Rudolf; and Kleininger, Werner, to M.A.N. -Roland Druckmaschinen Aktiengesellschaft. Reversible-drive offset rotary printing machine. 4,398,464, Cl. 101-177.000.

Morel, Didier, to Rhone-Poulenc Industries. Methylenically-substituted undecadienes. 4,399,301, Cl. 560-261.000.

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Moriguchi, Haruhiko; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Heat-sensitive recording head. 4,399,444, Cl. 346-76.0PH.

Moriguchi, Yasuo: *See*—
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Morris, Peter J., to Westinghouse Electric Corp. Protection and control system for a nuclear reactor. 4,399,095, Cl. 376-216.000.

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Amouroux, Jacques; and Morvan, Daniel, 4,399,116, Cl. 423-348.000.

Mosley, Thomas C., Jr. Jawed, lathe chuck. 4,398,733, Cl. 279-1.0TE.

Moss, Owen R.; and Briant, James K., to Hazleton Systems, Inc. Exposure chamber. 4,398,498, Cl. 119-15.000.

Moss, Timothy E.: *See*—
Gupta, Indra; Fostini, Raymond V.; and Moss, Timothy E., 4,398,950, Cl. 75-124.000.

Motion Marker Systems, Incorporated: *See*—
Johns, Paul J., 4,398,893, Cl. 434-305.000.

Motomura, Kenichi: *See*—
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Motor Wheel Corporation: *See*—
Smith, Richard W., 4,398,770, Cl. 301-37.0SS.

Motorola, Inc.: *See*—
Berg, Howard M.; Lewis, Gary L.; and Mitchell, Curtis W., 4,399,453, Cl. 357-81.000.
Joseph, Eric D., 4,399,399, Cl. 323-315.000.
Lunn, Gerald K.; and McGinn, Michael, 4,399,561, Cl. 455-266.000.
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Motroni, Giuseppe: *See*—
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Mott, Lambert H. Chromatographic column terminator element and assembly. 4,399,032, Cl. 210-198.200.

Motter Printing Press Co.: *See*—
Yessler, Ralph A., II, 4,398,463, Cl. 101-169.000.

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Rabinovich, Georgy L.; Lukina, Zoya P.; Volkova, Kira L.; and Mozhaiko, Viktor N., 4,399,051, Cl. 252-415.000.

Mta Mezogazdasagi Kutato Intezet: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Rucker, Gerhard; Weidmann, Wilfried; and Reisenweber, Karl-Ullrich, 4,398,730, Cl. 277-96.100.

Mueller, Franz-Josef: *See*—
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Mues, Volker: *See*—
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Fukui, Yukimasa; Mukaida, Heihachiro; and Inden, Masato, 4,399,024, Cl. 208-131.000.

Mullender, Claude, to B. F. Goodrich Company, The. Tire building apparatus. 4,398,988, Cl. 156-405.100.

Muller, Jakob; and Schreiber, Peter, to Fael SA. Method and apparatus for resistance welding of cans. 4,399,343, Cl. 219-64.000.

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Preiner, Gerhard; Muller, Johann; and Wegehaupt, Karl-Heinrich, 4,399,193, Cl. 428-447.000.

Multivac Sepp Haggenmuller KG: *See*—
Vetter, Artur; and Medwed, Emmerich, 4,398,883, Cl. 432-225.000.

Mulvanny, Patrick; and Bartky, Scott, to Nicolet Instrument Corporation. Flexible video synchronization circuit. 4,399,459, Cl. 358-150.000.

Munich, Terry L.: *See*—
Young, Steven J.; Semmel, Gary K.; and Munich, Terry L., 4,398,564, Cl. 138-92.000.

Muntwyler, Rene: *See*—
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Murata Kikai Kabushiki Kaisha: *See*—
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Murphy, Brian J.: *See*—
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Murphy, William W., to Torrington Company, The. Roller assembly with roller retention mechanism. 4,398,777, Cl. 308-207.00R.

Murray, Edwin G., to Chickasha Rentals, Inc. Rotating blowout preventor with adaptor. 4,398,599, Cl. 166-95.000.

Murray, John A., to Conger/Murray Systems, Inc. Concrete mixes. 4,398,960, Cl. 106-97.000.

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Murrer, Barry A.: *See*—
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Muszkiewicz, Robert P., to Motorola Inc. Minimum power, feedback controller, transmit/receive switch. 4,399,557, Cl. 455-82.000.

Mutai, Masahiko: *See*—
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Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; Nokata, Kenichiro; and Hagiwara, Hisao, 4,399,282, Cl. 546-48.000.

Muto, Norio: *See*—
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Mutrux, Claude: *See*—
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Muylle, Wilfried E.; and Buelens, Edward, to Agfa-Gevaert N.V. Cassette for holding and dispensing a roll of web material. 4,398,814, Cl. 354-275.000.

Mysicka, James C.: *See*—
Augustine, Robert J.; and Mysicka, James C., 4,398,364, Cl. 38-77.500.

Nabisco Brands, Inc.: *See*—
Caporaso, John A., 4,399,157, Cl. 426-108.000.
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Naegele, Paul: *See*—
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Nagahara, Kazuyuki, to Hitachi Koki Company, Limited. Battery casing. 4,399,201, Cl. 429-48.000.

Nagai, Nobuyuki: *See*—
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Nagano, Teruo; and Nagashima, Akira, to Fuji Photo Film Company Ltd. Photosensitive compositions. 4,399,210, Cl. 430-175.000.

Nagashima, Akira: *See*—
Nagano, Teruo; and Nagashima, Akira, 4,399,210, Cl. 430-175.000.

Nagata, Ryuichi: *See*—
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Nakagawa, Yasuhiko: *See*—
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Nakaguchi, Osamu; Okada, Satoshi; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Novel peptide, process for preparation thereof and use thereof. 4,399,066, Cl. 260-112.50R.
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Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Inoue, Ryuzaburou, 4,398,526, Cl. 123-606.000.
Nakaido, Shigehiro: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,399,202, Cl. 429-91.000.
Nakajima, Junzo; Kimura, Masatoshi; and Matsuda, Tadashi, to Fujitsu Limited. Electrophotographic copying printer. 4,398,816, Cl. 355-3.00R.
Nakajima, Toshio: *See*—
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Nakajima, Yoshio; Moriya, Takaharu; Nakamura, Hajime; Omosako, Koji; and Tokuta, Yoshio, to Nisshin Steel Company, Ltd. Reference electrode for oxygen probe. 4,399,022, Cl. 204-422.000.
Nakamura, Hajime: *See*—
Nakajima, Yoshio; Moriya, Takaharu; Nakamura, Hajime; Omosako, Koji; and Tokuta, Yoshio, 4,399,022, Cl. 204-422.000.
Nakamura, Hisao; and Uchida, Youji, to Mitsubishi Gas Chemical Company, Inc. Novel method of storing processed fish and roe. 4,399,161, Cl. 426-541.000.
Nakamura, Katsumi: *See*—
Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, 4,398,699, Cl. 266-50.000.
Nakamura, Koyo, to Nissan Motor Company, Limited. System for controlling no load operation of internal combustion engine. 4,398,514, Cl. 123-339.000.
Nakamura, Tsutomu: *See*—
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Nakashima, Kazuyuki; Araki, Youichi; Igarashi, Yukio; and Kojima, Shinjiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Explosion-proof semiconductor device. 4,399,452, Cl. 357-74.000.
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Nakashima, Yutaka; and Okada, Akira, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,399,189, Cl. 428-328.000.
Nakatani, Hiroshi; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Cash checking read operation in an electronic cash register. 4,399,508, Cl. 364-405.000.
Nakayama, Teruo: *See*—
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Nalle, George S., Jr. Rip resistant net. 4,399,184, Cl. 428-255.000.
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Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, LeRoy, 4,398,654, Cl. 222-402.100.
Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Scanning burst tachycardia control pacer. 4,398,536, Cl. 128-419.0PG.
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National Distillers and Chemical Corporation: *See*—
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Jones, Edwin V., 4,399,377, Cl. 307-465.000.
Klinner, Wilfred E., 4,398,384, Cl. 56-14.500.
National Rubber Company, Limited: *See*—
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NCR Canada Ltd.: *See*—
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Neelamegham, Ramaswami; and Priscu, John C., to Amax Inc. Coated magnesium granules having anti-caking properties. 4,398,947, Cl. 75-53.000.
Neese, James A., to Sparton Corporation. Reverse alarm. 4,399,427, Cl. 340-388.000.
Nehezvegyipari Kutato Intezet: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.
Neil, Iain A., to Barr & Stroud Limited. Collimation lens system. 4,398,786, Cl. 350-1.400.
Nelson, Alfred M.; Rasekhi, Houshang; and Sudano, John J., to Wang Laboratories, Inc. Magnetizing apparatus. 4,399,422, Cl. 335-284.000.
Nelson, Craig R.: *See*—
DuPont, Paul R.; and Nelson, Craig R., 4,398,879, Cl. 425-392.000.
Nelson, Joseph L.: *See*—
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Nemazi, John E., to General Motors Corporation. Adjustable roof engine swirl inlet port. 4,398,511, Cl. 123-188.00M.
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Geipel, Henry J., Jr.; and Nesbit, Larry A., 4,398,341, Cl. 29-578.000.
Nette, Friedrich W. Oscillatory mill. 4,398,675, Cl. 241-188.00R.
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Newman, Thomas C., to Akzona Incorporated. Use of ethoxylated dialkyl quaternary ammonium derivatives as suspending agents for coal-oil mixtures. 4,398,918, Cl. 44-51.000.
Nichifu Terminal Industries Co., Ltd.: *See*—
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Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., to United States of America, Navy. Thrust deflector and force augmentor. 4,398,687, Cl. 244-207.000.
Nicolet Instrument Corporation: *See*—
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Niederau, Cornelia; and Reinauer, Hans, to Panchem Gesellschaft fur chemische Produkte mbH. Process for determination of glycoxylated hemoglobin and reagent therefor. 4,399,227, Cl. 436-67.000.
Niederdellmann, Georg; Roemer, Norbert; Schenk, Jurgen; Hetzel, Hartmut; and Grigat, Ernst, to Bayer Aktiengesellschaft. Process for separating polyurethane hydrolyzates into polyether and diamine. 4,399,236, Cl. 521-49.000.
Niehaus, Jeffrey A.; and Ovens, Kevin M., to Texas Instruments Incorporated. Multiple-input binary adder. 4,399,517, Cl. 364-784.000.
Nield, Joseph G., to Texas Instruments Incorporated. Miniature electric circuit protector. 4,399,423, Cl. 337-102.000.
Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,398,554, Cl. 137-91.000.
Nihon Dennetsu Co., Ltd.: *See*—
Kurita, Yoshihiko; and Uchida, Naotaka, 4,399,493, Cl. 362-122.000.
Nikki-Universal Co., Ltd.: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,399,119, Cl. 423-626.000.
Nikon Nohyaku Co., Ltd.: *See*—
Kajioka, Mitsuru; Okawa, Katsumasa; and Taninaka, Kuniaki, 4,398,943, Cl. 71-92.000.
Nintendo Co., Ltd.: *See*—
Yokoi, Gunpei, 4,398,804, Cl. 350-337.000.
Nippon Electric Co., Ltd.: *See*—
Masuda, Hajime, 4,399,521, Cl. 365-180.000.
Nippon Kogaku K. K.: *See*—
Iizuka, Yutaka, 4,398,807, Cl. 350-427.000.
Nippon Oil and Fats Company, Limited: *See*—
Hattori, Katsuhide; Fukatsu, Yoshiaki; and Torii, Akio, 4,398,976, Cl. 149-21.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Tanimoto, Masafumi; Ieda, Nobuaki; and Wada, Masato, 4,399,372, Cl. 307-279.000.
Nishi, Chikao. Fish catcher. 4,398,368, Cl. 43-15.000.
Nishimiya, Toru; and Kurita, Toshiaki, to Tomy Kogyo Co., Inc. Random action toy. 4,398,719, Cl. 273-138.00R.
Nishimura, Fuminobu; and Kohyama, Mitsuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic developer apparatus for applying two different colored toners with the same applicator. 4,398,817, Cl. 355-4.000.
Nishioka, Kimihiko; and Yamashita, Nobuo, to Olympus Optical Co., Ltd. Viewing-direction changing optical system. 4,398,811, Cl. 350-506.000.
Nisidome, Teruo: *See*—
Imano, Shiro; Sasaki, Yoshio; Otsuka, Yukio; and Nisidome, Teruo, 4,399,031, Cl. 210-150.000.
Nissan Motor Company, Limited: *See*—
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Nisshin Steel Company, Ltd.: *See—*
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Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.
Nobel, Fred I.; and Braoch, William, to LeaRonal, Inc. Silver plating. 4,399,006, Cl. 204-29.000.
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Nohmi, Takashi; and Yamada, Takao, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyvinylidene fluoride type resin hollow filament microfilter and process for producing the same. 4,399,035, Cl. 210-500.200.
Nokata, Kenichiro: *See—*
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Nolte, Kenneth G., to Standard Oil Company (Indiana). Determination of fracturing fluid loss rate from pressure decline curve. 4,398,416, Cl. 73-155.000.
Nonnemann, Heinz W.: *See—*
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Norota, Susumu: *See—*
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Northern Telecom Limited: *See—*
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Norton-Berry, Philip: *See—*
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Novi Plastics Company: *See—*
Daniels, Phillip D., 4,398,639, Cl. 211-105.100.
Novotny, Lawrence G.; and Watts, Elvert S., to AMP Incorporated. Shielded electrical connector. 4,398,780, Cl. 339-49.00R.
Nozue, Ikuo: *See—*
Matsumura, Yoshio; Nozue, Ikuo; Tomomitsu, Osahiko; Ukachi, Takashi; and Suminoe, Taro, 4,399,266, Cl. 528-10.000.
Nubani, Jawdat I.; and Sawicki, Frank S., to RCA Corporation. Method of processing a cathode-ray tube for eliminating blocked apertures caused by charged particles. 4,398,897, Cl. 445-5.000.
Nuclear Systems, Inc.: *See—*
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Nugent, Edward L.; and Kaufman, Joseph, to Becton Dickinson and Company. Single and multiple sample needle assembly with vein entry indicator. 4,398,544, Cl. 128-763.000.
Numata, Tatsuo: *See—*
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Nutrisearch Company: *See—*
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Schulz, Alfred; and Zechnall, Martin, 4,398,520, Cl. 123-481.000.
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Taylor, Lothar J., 4,399,425, Cl. 340-27.0NA.

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Smith, Frederick R.; Toy, Walter W.; and Witiak, David, 4,399,255, Cl. 525-54.210.

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Ross, Oakley G.: *See*—
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Rossi, Pier P.; Jacuone, Roberto; and Magnoni, Franco, to Snia Viscosa Societa Nazional Industria Applicazioni Viscosa sPa. Process for purifying oxygen containing recycle gas deriving from ozonization. 4,399,292, Cl. 549-431.000.

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Rydborn, Sten A. O. Apparatus for stopping and resetting a loom. 4,398,568, Cl. 139-1.00R.

Rylander, Nicholas M. Pressure balancing stuffing gland for shafts. 4,398,727, Cl. 277-3.000.

Rynbrandt, Jay D., to Chevron Research Company. Internal combustion engine having manifold and combustion surfaces coated with a foam. 4,398,527, Cl. 123-668.000.

Saarem, Myrl J.; and Lovelace, Donald E., to Richdel, Inc. Motorized diverter valve. 4,398,562, Cl. 137-625.470.

SAB Automotive AB: *See*—
Segersten, Carl R., 4,398,929, Cl. 55-163.000.

Saccani, Remigio, to Ogfficina Macchine Per Stampa Su Oggetti O.M.-S.O. S.p.A. High productivity device for feeding cylindrical objects to silk-screen printing machines. 4,398,627, Cl. 198-339.000.

Safe-Base, Inc.: *See*—
Fuller, Charles C.; and Hendrickson, James L., 4,398,714, Cl. 273-25.000.

SAFINCO n.v.: *See*—
Tack, Andre A.; and Dijkstra, Albert J., 4,399,165, Cl. 426-613.000.

Sagawa, Yasuhiko; Norota, Susumu; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, to Teijin Limited. Process for producing a fibrous assembly. 4,399,084, Cl. 264-27.000.

Saint Gobain Vitrage: *See*—
Auger, Henri; and Acloque, Jean-Pierre, 4,398,802, Cl. 350-292.000.

Saito, Sadayuki; Fukunaga, Ichiro; Ito, Susumu; Nakamura, Katsumi; and Higuchi, Kazuya, to Kawasaki Steel Corporation. Device for removing fused slags on slabs. 4,398,699, Cl. 266-50.000.

Sakai, Atsuo: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,399,473, Cl. 360-10.300.

Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Kitahara, Makoto, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member with hydrazone compound. 4,399,207, Cl. 430-58.000.

Sakai, Kiyoshi: *See*—
Takasu, Yoshio; Takebayashi, Norie; Sakai, Kiyoshi; Mabuchi, Minoru; and Ishikawa, Shozo, 4,399,208, Cl. 430-59.000.

Sakowski, Walter J., to Olin Corporation. Production of neutral calcium hypochlorite from its dibasic salt. 4,399,117, Cl. 423-474.000.

Sakurai, Hisaya; Hamada, Minoru; Matsuzaki, Kazuhiko; and Aminaka, Muneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing polyacetal copolymers. 4,399,272, Cl. 528-233.000.

Samson, Marc: *See*—
Kleemann, Axel; Fahnenstich, Rudolf; and Samson, Marc, 4,399,302, Cl. 560-266.000.

Sandeau, Rene F., Jr.: *See*—
Ruwe, Victor W.; Kerr, James A.; and Sandeau, Rene F., Jr., 4,399,488, Cl. 361-412.000.

Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., to Mead Corporation, The. Transfer imaging system. 4,399,209. Cl. 430-138.000.

Sanders, Robert W. Hinged drawbar for boat trailer. 4,398,742, Cl. 280-491.00B.

Sanderson, John R., to Mobay Chemical Corporation. Nonhalogenated flame resistant sulfonyl amide copolycarbonate. 4,399,271, Cl. 528-172.000.

Sandlin, Felix M.; De Villez, Richard L.; and Waller, Jack D. Moisture collecting chamber. 4,398,543, Cl. 128-760.000.

Sandoz Products Limited: *See*—
Bentham, John; Coates, Jacqueline A.; and Connell, David L., 4,399,050, Cl. 252-95.000.

Sankin Engineering Company Limited: *See*—
Yamazaki, Sakuzo, 4,398,327, Cl. 29-33.00R.

San Luis, Carlos T.: *See*—
Azzarello, Joseph A.; and San Luis, Carlos T., 4,398,745, Cl. 280-508.000.

Sano, Kinzi: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,399,089, Cl. 264-57.000.

Santini, John, to TII Electronics, Inc. Accelerator control for electric vehicles. 4,399,393, Cl. 318-313.000.

Santrade Ltd.: *See*—
Kullander, Gregor H.; Chatfield, Christopher G.; Mikus, Marian; and Westergren, Bo K., 4,399,168, Cl. 427-255.700.

Sanyo Electric Co., Ltd.: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,399,202, Cl. 429-91.000.
Tanaka, Kanji; and Usui, Noboru, 4,399,325, Cl. 179-1.0GM.
Yasuoka, Yoshio, 4,399,341, Cl. 219-10.55R.

Sapi, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.

Sarig, Sara; Garti, Nissim; and Tibika, Francoise, to Yissum Research Development Company of the Hebrew University of Jerusalem. Method and kit for diagnosing a patient's proneness to develop calcium oxalate kidney stones. 4,399,003, Cl. 204-1.00T.

Sarin, Vinod K., to GTE Products Corporation. Mining drill. 4,398,611, Cl. 175-413.000.

Sasaki, Hideharu; Nakamura, Tsutomu; Shimada, Keizo; Aito, Yuzo; and Tabe, Yutaka, to Teijin Limited. Papery product. 4,398,995, Cl. 162-157.300.

Sasaki, Yoshio: *See*—
Imano, Shiro; Sasaki, Yoshio; Otsuka, Yukio; and Nisidome, Teruo, 4,399,031, Cl. 210-150.000.

Sasashige, Hiroaki: *See*—
Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,398,328, Cl. 29-126.000.

Sashiki, Takashi: *See*—
Mikami, Yoshiharu; Sashiki, Takashi; and Asai, Yoshiharu, 4,398,612, Cl. 177-25.000.

Satake, Keigo: *See*—
Aoki, Katsumichi; Arabori, Hideo; Satake, Keigo; and Shinkawa, Hiroyasu, 4,398,944, Cl. 71-118.000.

Satake, Tosimi: *See*—
Yamato, Noboru; and Satake, Tosimi, 4,399,188, Cl. 428-320.400.

Sato, Akira: *See*—
Kondo, Syunichi; Matsufuji, Akihiro; Umehara, Akira; Ukai, Toshinao; and Sato, Akira, 4,399,211, Cl. 430-269.000.

Sato, Haruyo: *See*—
Imamura, Shinzo; Sato, Haruyo; and Kuramoto, Hiroyoshi, 4,399,289, Cl. 548-507.000.

Sato, Kimihiko; Terase, Kunihiko; and Kijimuta, Hitoshi, to Asahi Glass Company Ltd. Synthesis of silicon nitride. 4,399,115, Cl. 423-344.000.

Sato, Yoshinori: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,399,153, Cl. 426-5.000.

Sato, Yuji; and Koizumi, Shoji, to Furuno Electric Co., Ltd. Recorder for an underwater detection system. 4,399,445, Cl. 346-136.000.

Satoh, Ken; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Display apparatus for tape running positions. 4,399,355, Cl. 377-18.000.

Satomi, Toyokazu; Kanmoto, Yoshiaki; and Tabata, Yasuhiro, to Ricoh Co., Ltd. Alarm or warning device for signaling left-behind master or original. 4,399,431, Cl. 340-568.000.

Sauer, Robert L. Flowable product metering and dispensing machine. 4,398,577, Cl. 141-135.000.

Saunders, Norman B. Solar collector and heating and cooling system. 4,398,530, Cl. 126-439.000.

Sawada, Seigo: *See*—
Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; and Nokata, Kenichiro, 4,399,276, Cl. 542-416.000.
Miyasaka, Tadashi; Mutai, Masahiko; Sawada, Seigo; Nokata, Kenichiro; and Hagiwara, Hisao, 4,399,282, Cl. 546-48.000.

Sawaki, Ryoichi, to Olympus Optical Company Ltd. Fixture device for magnetic head. 4,399,478, Cl. 360-109.000.

Sawicki, Frank S.: *See*—
Nubani, Jawdat I.; and Sawicki, Frank S., 4,398,897, Cl. 445-5.000.

Sawyer, Wilbur H.: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,399,125, Cl. 424-177.000.

Schaefer, Frederic C., to American Cyanamid Company. Preparation of tertiary alkyl isocyanates. 4,399,073, Cl. 260-453.00P.

Schaefer, Frederic C., to American Cyanamid Company. Preparation of tertiary alkyl isocyanates. 4,399,074, Cl. 260-453.00P.

Schaeffer, Daniel, to Vorne Industries, Inc. Digital rate monitor. 4,399,354, Cl. 377-26.000.

Schantz, Ronald K.: *See*—
Kirkham, Steven C.; and Schantz, Ronald K., 4,398,869, Cl. 417-216.000.

Schaub, Robert E.; Upselacis, Janis; and Bernstein, Seymour, to American Cyanamid Company. Modulators of the complement system. 4,399,126, Cl. 424-180.000.

Schenck, Hans-Uwe: *See*—
Gimpel, Jurgen; Feuerherd, Karl-Heinz; and Schenck, Hans-Uwe, 4,399,256, Cl. 525-111.000.

Schenk, Jurgen: *See*—
Niederdellmann, Georg; Roemer, Norbert; Schenk, Jurgen; Hetzel, Hartmut; and Grigat, Ernst, 4,399,236, Cl. 521-49.000.

Schey, John A., to Modine Manufacturing Company. Integral flanges in a sheet. 4,399,196, Cl. 428-582.000.

Schilla, Henning: *See*—
Haeussler, Ernst; Hatz, Ernst; Malmen, Olle; Schilla, Henning; and Schlick, Karl E., 4,398,762, Cl. 294-89.000.

Schiller, August: *See*—
Bosch, Erhard; Craubner, Ingo; Dorsch, Norman; Schiller, August; and Sommer, Oswin, 4,399,267, Cl. 528-30.000.

Schillinger, Joseph F., to Champion International Corporation. Internally divided carton. 4,398,661, Cl. 229-27.000.

Schillinger, Thomas J.: *See*—
Cormier, Alan D.; Czaban, John D.; Schillinger, Thomas J.; Legg, Kenneth D.; and Kelley, Thomas F., 4,399,362, Cl. 250-430.000.

Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Straight knitting machine. 4,398,401, Cl. 66-64.000.

Schionning & Arve' A/S: *See*—
Christensen, Jorn, 4,398,732, Cl. 277-207.00A.

Schlegal Corporation: *See*—
Annis, Gerald A., 4,399,337, Cl. 200-16.00B.

Schlick, Karl E.: *See*—
Haeussler, Ernst; Hatz, Ernst; Malmen, Olle; Schilla, Henning; and Schlick, Karl E., 4,398,762, Cl. 294-89.000.

Schlienger, Max P.; and Szeto, Whalun, to Retech, Inc. Method of operating high speed electric arc saw. 4,399,344, Cl. 219-68.000.

Schmalbein, Dieter: *See*—
Biehl, Reinhard; and Schmalbein, Dieter, 4,399,406, Cl. 324-316.000.

Schmerzler, Lawrence J. Motor-driven, expander-compressor transducer. 4,398,396, Cl. 62-116.000.

Schmetzer, William M. Aircraft with thrust and lift augmenting airfoil. 4,398,683, Cl. 244-12.500.

Schmid, Werner: *See*—
de Sousa, Bernardo; Muntwyler, Rene; and Schmid, Werner, 4,399,280, Cl. 544-301.000.

Schmidt, Paul J.; and Jefferies, Patrick J., to Sterling Drug Inc. Process for the production of substituted aminophthalides. 4,399,291, Cl. 549-308.000.

Schmidt, Robert R.: *See*—
Forster, Heinz; Hofer, Wolfgang; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,399,285, Cl. 546-210.000.

Schmidt, Roland: *See*—
Sepp, Gunther; Diehl, Christian; Bogenberger, Richard; Born, Gunthard; Mohr, Friedbert; Schmidt, Roland; Schnaebele, Werner; and Thalmair, Korbinian, 4,398,466, Cl. 102-427.000.

Schmitt, Edward L.: *See*—
Caroleo, Steven J.; and Schmitt, Edward L., 4,398,754, Cl. 285-45.000.
Schmitt, Wilhelm, to Carl Freudenberg, Firma. Device for attachment to motor vehicle windows to prevent fogging or icing. 4,399,347, Cl. 219-203.000.
Schmutz, Lawrence E.: *See*—
Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, 4,399,356, Cl. 250-201.000.
Schnaebele, Werner: *See*—
Sepp, Gunther; Diehl, Christian; Bogenberger, Richard; Born, Gunthard; Mohr, Friedbert; Schmidt, Roland; Schnaebele, Werner; and Thalmair, Korbinian, 4,398,466, Cl. 102-427.000.
Schneider, Abraham I.: *See*—
Burdette, George W.; and Schneider, Abraham I., 4,398,978, Cl. 149-109.600.
Schneider, Kurt: *See*—
Thoemel, Frank; Seib, Karl; Schneider, Kurt; and Naegele, Paul, 4,399,297, Cl. 560-55.000.
Schneider, Michael; Kochloefl, Karl; Diez, Gerhard; Maier, Franz; Rauch, Josef E.; and Liebelt, Wolfgang, to Sud-Chemie A.G. Procedure for the thermal treatment of powdered and granulated catalysts and the like. 4,399,350, Cl. 219-388.000.
Schneider, Michel; Guillot, Christian; and Ayerbe, Andre, to Fisons Limited. Enzyme production and purification. 4,399,221, Cl. 435-193.000.
Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,399,296, Cl. 556-416.000.
Schoenfelder, James L. Solar heating wall. 4,398,529, Cl. 126-436.000.
Scholl, Hans; and Vogt, Siegfried, to Kochs Adler AG. Feeding device for an automatic sewing arrangement. 4,398,480, Cl. 112-121.120.
Schoonmaker, Charles D.: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; Wruk, Philip J.; and Lee, Edward P., deceased, 4,399,158, Cl. 426-112.000.
Schoppel, Roman; Fischer, Wolfgang; and Harloff, Bernd, to Daimler-Benz Aktiengesellschaft. Load rod for vehicles. 4,398,744, Cl. 280-504.000.
Schottker, Willi: *See*—
Wahlmann, Ernst; and Schottker, Willi, 4,398,751, Cl. 280-808.000.
Schreck, David J., to Union Carbide Corporation. Production of ethylene by the pyrolysis of ethyl acetate. 4,399,305, Cl. 562-607.000.
Schreiber, Peter: *See*—
Muller, Jakob; and Schreiber, Peter, 4,399,343, Cl. 219-64.000.
Schrinner, Elmar: *See*—
Durckheimer, Walter; Ehlers, Eberhard; Seliger, Hubert; and Schrinner, Elmar, 4,399,131, Cl. 424-246.000.
Schroedel, Cynthia J.: *See*—
Bok, Song H.; Jackson, LeRoy E.; Schroedel, Cynthia J.; and Seidman, Martin, 4,399,222, Cl. 435-234.000.
Schroeder, Robert E.: *See*—
Clarke, Patrick W.; and Schroeder, Robert E., 4,399,500, Cl. 363-97.000.
Schroeder, William L., to Dresser Industries, Inc. Pivot pin assembly. 4,398,862, Cl. 414-723.000.
Schron, Steven M., to Xerox Corporation. Combination scroll and marquee display. 4,398,819, Cl. 355-14.00R.
Schubert & Salzer: *See*—
Studtmann, Rainer, 4,398,385, Cl. 57-18.000.
Schubring, Gary L., to USM Corporation. Check strap. 4,398,317, Cl. 16-82.000.
Schulte, Klaus: *See*—
Coblenz, Rolf; Schulte, Klaus; Ebeling, Wilfried; and Evertz, Dieter, 4,399,104, Cl. 422-111.000.
Schulz, Alfred; and Zechnall, Martin, to Robert Bosch GmbH. Ignition and fuel injection system for multicylinder engines. 4,398,520, Cl. 123-481.000.
Schulz, Ralf-Thilo: *See*—
Hahn, Michael; Wackerle, Peter; Eschenfelder, Peter; and Schulz, Ralf-Thilo, 4,398,693, Cl. 249-155.000.
Schulze, Eckehart; and Kuttruf, Werner, to Hartmann & Lammle GmbH & Co. KG. Feeding device, in particular for the cycled feeding of rod or tape like material in presses, cutters, or the like. 4,398,657, Cl. 226-11.000.
Schurr, Paul E.; and Day, Charles E., to Upjohn Company, The. Treatment of atherosclerosis with khellin-related furochromones. 4,399,146, Cl. 424-283.000.
Schuss, Werner; and Hain, Johann, to Siemens Aktiengesellschaft. Rotatable socket for a dental handpiece. 4,398,886, Cl. 433-128.000.
Schuurman, Eiko A., to McNamara, John M., a part interest. Dual flow propane unit. 4,398,521, Cl. 123-527.000.
Schwaninger, Peter: *See*—
Kuhni, Heinz; and Schwaninger, Peter, 4,398,990, Cl. 156-510.000.
Schwartz, Robert D.; and Bodie, Elizabeth A., to Stauffer Chemical Company. Thickening composition from fermented whey. 4,399,160, Cl. 426-41.000.
Schwendemann, Kenneth L.; and Long, Olen R., to Otis Engineering Corporation. Parking tool for pumpdown well completion system. 4,398,601, Cl. 166-217.000.
SCM Corporation: *See*—
Ting, Vincent W.; Woo, James T. K.; and Marcinko, Richard M., 4,399,241, Cl. 523-400.000.
Scott, Ernest R.; and Strnad, Raymond J., to Scott & Fetzer Company, The. Speed selector switch. 4,398,316, Cl. 15-332.000.
Scott & Fetzer Company, The: *See*—
Scott, Ernest R.; and Strnad, Raymond J., 4,398,316, Cl. 15-332.000.
Scribner, Belding H.: *See*—
Babb, Albert L.; and Scribner, Belding H., 4,399,036, Cl. 210-638.000.
Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. Optically active tert-alkyl 7-(2-oxo-5-carbonyloxypyrrolidinyl)heptanoates. 4,399,290, Cl. 548-534.000.
Sears, Karl D., to ITT Corporation. Preparation of highly reactive cellulose. 4,399,275, Cl. 536-70.000.
Seaward, William S.: *See*—
Janssen, Donovan M.; Magno, Robert; and Seaward, William S., 4,398,709, Cl. 271-10.000.
Sebag, Henri: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,399,077, Cl. 260-501.130.
Vanlerberghe, Guy; and Sebag, Henri, 4,399,313, Cl. 568-622.000.
Sebag, Henry: *See*—
Vanlerberghe, Guy; and Sebag, Henry, 4,398,912, Cl. 8-405.000.
Second Foundation: *See*—
Proudian, Andrew, 4,398,539, Cl. 128-660.000.
Secosky, Paul F.: *See*—
Louder, Nevitt M.; Cuomo, Carlo E.; and Secosky, Paul F., 4,399,433, Cl. 340-626.000.
Seddon, Alan E., to BICC Public Limited Company. Overhead electric traction systems. 4,398,624, Cl. 191-40.000.
Segawa, Makoto: *See*—
Ariizumi, Shoji; Segawa, Makoto; Maiwa, Hisaaki; and Okamoto, Seishi, 4,399,520, Cl. 365-174.000.
Segersten, Carl R., to SAB Automotive AB. Compressed air dehumidifier. 4,398,929, Cl. 55-163.000.
Seib, Karl: *See*—
Thoemel, Frank; Seib, Karl; Schneider, Kurt; and Naegele, Paul, 4,399,297, Cl. 560-55.000.
Seidel, Hans: *See*—
Gauhl, Helmgard; Seidel, Hans; Lang, Gunter; Roder, Albert; and Ziegenhorn, Joachim, 4,399,218, Cl. 435-25.000.
Seidman, Martin: *See*—
Bok, Song H.; Jackson, LeRoy E.; Schroedel, Cynthia J.; and Seidman, Martin, 4,399,222, Cl. 435-234.000.
Seiling, Samuel O., to AMF Incorporated. Proofer tray assembly having stepped release coating retaining surfaces. 4,398,880, Cl. 425-439.000.
Seiver, Robert L.; and Gernand, Martin O., to Exxon Research and Engineering Co. Composition for use in a magnetically fluidized bed. 4,399,047, Cl. 252-62.550.
Sekimoto, Kunio: *See*—
Yamamoto, Katsuhiko; Yamamitsu, Chojuro; Sekimoto, Kunio; and Kurashina, Kozo, 4,399,472, Cl. 358-320.000.
Sekine, Kazumi, to Canon Kabushiki Kaisha. Printer. 4,398,460, Cl. 101-93.150.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Imano, Shiro; Sasaki, Yoshio; Otsuka, Yukio; and Nisidome, Teruo, 4,399,031, Cl. 210-150.000.
Seliger, Hubert: *See*—
Durckheimer, Walter; Ehlers, Eberhard; Seliger, Hubert; and Schrinner, Elmar, 4,399,131, Cl. 424-246.000.
Selle, James E.: *See*—
DeVan, Jackson H.; and Selle, James E., 4,398,967, Cl. 148-6.110.
Selman, Gordon L.: *See*—
McGill, Ian R.; and Selman, Gordon L., 4,399,199, Cl. 428-633.000.
Semmel, Gary K.: *See*—
Young, Steven J.; Semmel, Gary K.; and Munich, Terry L., 4,398,564, Cl. 138-92.000.
Sempel, Adrianus, to U.S. Philips Corporation. Current stabilizer comprising enhancement field-effect transistors. 4,399,375, Cl. 307-297.000.
Senyek, Michael L., to Goodyear Tire & Rubber Company, The. Removal of acrylonitrile from latex with saturated heterocyclic amines. 4,399,240, Cl. 523-332.000.
Sepp, Gunther; Diehl, Christian; Bogenberger, Richard; Born, Gunthard; Mohr, Friedbert; Schmidt, Roland; Schnaebele, Werner; and Thalmair, Korbinian, to Messerschmitt-Boelkow-Blohm GmbH. Method and apparatus for avoiding an undesired firing of a weapon. 4,398,466, Cl. 102-427.000.
Seragnoli, Enzo, to G.D. Societa' per Azioni. Device for simultaneously cutting two continuous rods of cigarette. 4,398,438, Cl. 83-310.000.
Sercati: *See*—
Offenstadt, Eric; and Houze, Bernard, 4,398,509, Cl. 123-73.0CC.
Seyfert, William J.: *See*—
Pagano, Victor H.; and Seyfert, William J., 4,398,446, Cl. 89-36.00H.
Shaffer, Douglas E.: *See*—
Williams, Alvin R.; and Shaffer, Douglas E., 4,398,470, Cl. 109-52.000.
Shanley, Robert L., II: *See*—
Harwood, Leopold A.; Shanley, Robert L., II; and Hettiger, James, 4,399,460, Cl. 358-166.000.
Shao, Michael: *See*—
Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, 4,399,356, Cl. 250-201.000.
Sharp Kabushiki Kaisha: *See*—
Endo, Yoshihiro; Yamashita, Yoshito; Kishishita, Hiroshi; and Uede, Hisashi, 4,399,015, Cl. 204-192.00P.

Muguruma, Norio; Morihisa, Mitsuo; and Akao, Hideyuki, 4,399,524, Cl. 365-229.000.
Nakatani, Hiroshi; and Yamamoto, Hachizou, 4,399,508, Cl. 364-405.000.
Shell Oil Company: *See—*
Ten Haken, Pieter; Naisby, Thomas W.; and Gray, Andrew C. G., 4,399,149, Cl. 424-309.000.
Sherwin, Martin B.; and Frank, Marshall E., to Chem Systems Inc. Process for preparing oxirane compounds. 4,399,295, Cl. 549-518.000.
Sherwood, Richard C.: *See—*
Bordelon, Chester M.; Chin, Gilbert Y.; Jin, Sungho; Sherwood, Richard C.; and Wernick, Jack H., 4,398,972, Cl. 148-31.550.
Shevlin, Thomas S., to Minnesota Mining and Manufacturing Company. Ceramic fabric filter. 4,398,931, Cl. 55-341.00R.
Shibata, Atsushi: *See—*
Koike, Takeshi; and Shibata, Atsushi, 4,399,365, Cl. 250-492.200.
Shibata, Masaki: *See—*
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,399,153, Cl. 426-5.000.
Shick, Jack N. Can shaker kit for attachment to a vibrating power sander. 4,398,829, Cl. 366-110.000.
Shimada, Keizo: *See—*
Sasaki, Hideharu; Nakamura, Tsutomu; Shimada, Keizo; Aito, Yuzo; and Tabe, Yutaka, 4,398,995, Cl. 162-157.300.
Shimohigashi, Katsuhiro: *See—*
Masuda, Hiroo; and Shimohigashi, Katsuhiro, 4,399,519, Cl. 365-149.000.
Shimoie, Shizuo, to Kubota Ltd. Maneuvering portion structure of an excavation work vehicle. 4,398,861, Cl. 414-694.000.
Shimoji, Katsuichi: *See—*
Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohisa; and Ito, Hiroyuki, 4,399,147, Cl. 424-285.000.
Shimomae, Katsuro, to Trio Kabushiki Kaisha. Tape recorder. 4,399,475, Cl. 360-96.300.
Shimotake, Hiroshi: *See—*
Koyama, Koichiro; and Shimotake, Hiroshi, 4,398,968, Cl. 148-6.110.
Shine, William P.: *See—*
Ziff, Stephen J.; Sieron, Richard L.; and Shine, William P., 4,399,371, Cl. 307-147.000.
Shinkawa, Hiroyasu: *See—*
Aoki, Katsumichi; Arabori, Hideo; Satake, Keigo; and Shinkawa, Hiroyasu, 4,398,944, Cl. 71-118.000.
Shinryo Air Conditioning Co., Ltd.: *See—*
Suzuki, Akira; Shioya, Yasumi; and Kimura, Keiichi, 4,398,476, Cl. 110-346.000.
Shinshu Seiki Kabushiki Kaisha: *See—*
Koike, Isomu, 4,398,461, Cl. 101-99.000.
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Suzuki, Akira; Shioya, Yasumi; and Kimura, Keiichi, 4,398,476, Cl. 110-346.000.
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Shipley, Randall S.; Birkelbach, Donald F.; and Lowery, Kirby, Jr., to Dow Chemical Company, The. High efficiency catalyst containing titanium, zirconium and zinc for polymerizing olefins. 4,399,053, Cl. 252-429.00B.
Shipley, Randall S., to Dow Chemical Company, The. Organo zirconium-chromium mixtures, catalyst prepared therefrom and polymerization of olefins therewith. 4,399,056, Cl. 252-431.00C.
Shirai, Kazunari, to Fujitsu Limited. Semiconductor device and method for production thereof. 4,399,451, Cl. 357-59.000.
Shireman, Phillip E., to Standard Change-Makers, Inc. Coin dispensing mechanism. 4,398,550, Cl. 133-1.00A.
Shiroto, Yoshimi; Higashi, Takehito; and Ono, Takeo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for hydrotreating heavy hydrocarbon oils, catalysts therefor, and a method of preparing such catalysts. 4,399,026, Cl. 208-216.0PP.
Shitamatsu, Ryujiro: *See—*
Tanaka, Yoshiro; Fujii, Noritsugu; Akagi, Kazuo; and Shitamatsu, Ryujiro, 4,398,552, Cl. 134-57.00R.
Short, Robert G.: *See—*
Flider, Frank J.; Orthoefer, Frank T.; and Short, Robert G., 4,399,224, Cl. 435-271.000.
Shrum, Kenneth L.: *See—*
Sohn, Fred; and Shrum, Kenneth L., 4,398,580, Cl. 144-357.000.
Shum, Lanson Y., to Westinghouse Electric Corp. Pick and place robot. 4,398,863, Cl. 414-733.000.
Shutt, Sidney G., to Rockwell International Corporation. Three-axis accelerometer having flexure bearing with overload protection. 4,398,417, Cl. 73-514.000.
Shutt, Sidney G.; Dorsman, Adrian K.; and Wilcox, Doyle E., to Rockwell International Corporation. Three-axis accelerometer having improved magnet configuration. 4,398,418, Cl. 73-517.00B.
Sickert, Paulo, to RCA Corporation. Preparation of video disc molding composition. 4,399,061, Cl. 252-511.000.
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Siegel, William T.: *See—*
Kelsey, Paul V., Jr.; and Siegel, William T., 4,398,980, Cl. 156-89.000.
Siegmund, Gary G.; and Kretschmann, Robert J., to Reliance Electric Co. Circuit for generating two periodic signals having a controllable phase relationship therebetween. 4,399,410, Cl. 328-55.000.
Siemens AG: *See—*
Neumann, Leopold, 4,399,487, Cl. 361-391.000.
Siemens Aktiengesellschaft: *See—*
Bardl, Artur, 4,399,518, Cl. 365-45.000.
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,399,018, Cl. 204-199.000.
Geuns, Guy; and Rotzer, Georg, 4,398,851, Cl. 405-302.000.
Haerten, Rainer, 4,398,422, Cl. 73-626.000.
Kuenzel, Roland, 4,399,330, Cl. 179-2.0EB.
Schuss, Werner; and Hain, Johann, 4,398,886, Cl. 433-128.000.
Welzhofer, Klaus, 4,399,405, Cl. 324-73.0AT.
Siemens Corporation: *See—*
Southard, Gary D., 4,399,535, Cl. 370-110.200.
Sieron, Richard L.: *See—*
Ziff, Stephen J.; Sieron, Richard L.; and Shine, William P., 4,399,371, Cl. 307-147.000.
Signetics Corporation: *See—*
Malwah, Manohar L., 4,398,964, Cl. 148-1.500.
Sikora, Helga: *See—*
Herwig, Walter; Erbes, Kurt; Decker, Rudolf; and Sikora, Helga, 4,399,239, Cl. 521-137.000.
Silverstein, Saul J.: *See—*
Axel, Richard; Wigler, Michael H.; and Silverstein, Saul J., 4,399,216, Cl. 435-6.000.
Silvey, Elmer R. Saw chain depth gauge grinder. 4,398,437, Cl. 76-25.00A.
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., to GTE Automatic Electric Labs Inc. Dual rail time and control unit for a duplex T-S-T-digital switching system. 4,399,369, Cl. 307-63.000.
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Simons, Shelden M. Roller supported sliding shower caddy. 4,398,309, Cl. 4-605.000.
Sims, Anson: *See—*
Jones, Lawrence T.; Howden, Ashley; Knighton, Mark S.; Sims, Anson; Kittinger, David L.; and Hollander, Richard E., 4,398,720, Cl. 273-238.000.
Singer Company, The: *See—*
Forrest, David, 4,398,482, Cl. 112-316.000.
Singh, Udai P.; and Lutz, John T., Jr., to Rohm and Haas Company. Plasticizer, plasticized resin composition and process for preparation thereof. 4,399,248, Cl. 524-205.000.
SIP - Societa Italiana per L'Esercizio Telefonico p.a.: *See—*
Furlan, Antonio; Thiella, Francesco; and Tibaldo, Flavio, 4,399,332, Cl. 179-8.00A.
Siposs, George G. Insulin delivery system. 4,398,908, Cl. 604-31.000.
Sitek, George J., to Leco Corporation. Calorimeter. 4,398,836, Cl. 374-38.000.
Sjoerdsma, Albert; and McCann, Peter P., to Merrell Dow Pharmaceuticals Inc. Method of inhibiting the growth of protozoa. 4,399,151, Cl. 424-319.000.
Skogward, Kenneth O. E.: *See—*
Bergvall, Bengt A.; and Skogward, Kenneth O. E., 4,398,348, Cl. 33-133.000.
Slegers, Leonhard: *See—*
Becker, Manfred; Melchior, Klaus; and Slegers, Leonhard, 4,399,082, Cl. 261-124.000.
Small, William M., to Phillips Petroleum Company. Vortex generators. 4,398,595, Cl. 165-109.00R.
Smiley, Martin B., to Societe d'Assistance Technique pour Produits Nestle S.A. Stabilizing lactobacilli. 4,399,220, Cl. 435-139.000.
Smith, Frederick R.; Toy, Walter W.; and Witiak, David, to Avtex Fibers Inc.; and Rohm & Haas Co. Alloy rayon fibers of regenerated cellulose and copolymeric acrylic acid salts. 4,399,255, Cl. 525-54.210.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,399,142, Cl. 424-258.000.
Smith, Leslie H.: *See—*
Barlow, Jeffrey J.; and Smith, Leslie H., 4,399,138, Cl. 424-250.000.
Smith, Richard W., to Motor Wheel Corporation. Wire spoke vehicle wheel and method of manufacture. 4,398,770, Cl. 301-37.0SS.
Smith, Robert C., Jr.; and McGlen, James A., to Eastman Kodak Company. Binding method. 4,398,986, Cl. 156-290.000.
Smollin, Charles F., to RCA Corporation. Cascaded digital broadcast transmitter. 4,399,558, Cl. 455-108.000.
Smulders, Hendricus F. G.; and Bartman, Gerrit E., to U.S. Philips Corporation. Method and device for the high-precision manufacture of glass articles, in particular lenses. 4,398,935, Cl. 65-64.000.
Snia Viscosa Societa Nazional Industria Applicazioni Viscosa sPa: *See—*
Rossi, Pier P.; Jacuone, Roberto; and Magnoni, Franco, 4,399,292, Cl. 549-431.000.
Snow, Roger L., Sr.; and Atkinson, Thomas J. Manufacture of pipe thread protectors. 4,399,092, Cl. 264-318.000.
Snyder, Michael D.; Dean, Weibley J.; Merithew, David L.; Ragard, Philip A.; and Matson, Crawford A., to Universal Instruments Corporation. High speed radial lead component sequencing and inserting machine. 4,398,658, Cl. 227-46.000.

Societe Anonyme dite: Compagnie Generale d'Electricite: *See*—
Kaltenbach, Guy; and Lerner, Pierre, 4,399,230, Cl. 501-20.000.
Societe Anonyme dite: L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,399,313, Cl. 568-622.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Hirsbrunner, Pierre, 4,399,128, Cl. 424-230.000.
Smiley, Martin B., 4,399,220, Cl. 435-139.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Camboulives, Andre A. M. L.; Hallinger, Claude C.; and Vandenbroucke, Roger A. J., 4,398,864, Cl. 415-134.000.
Societe Nationale Elf Aquitaine: *See*—
Voirin, Robert, 4,399,112, Cl. 423-230.000.
Societe Rolba: *See*—
Jaffrennou, Bernard; and Cessou, Maurice, 4,398,844, Cl. 405-72.000.
Societe Vetrotex Saint-Gobain: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,398,933, Cl. 65-1.000.
Sodastream Limited: *See*—
Mabb, Kenneth G., 4,399,081, Cl. 261-121.00R.
Sohn, Fred; and Shrum, Kenneth L., to Sun Studs, Inc. Veneer lathe log charger system having enhanced accuracy and rate of production. 4,398,580, Cl. 144-357.000.
Solimeno, Duane: *See*—
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,399,331, Cl. 179-5.00R.
Solomon, Arie. Musical toy. 4,398,892, Cl. 434-259.000.
Soma, Masafumi; and Kohno, Yoshihiko, to Iwasaki Tsushinki Kabushiki Kaisha. Waveform searching system. 4,399,512, Cl. 364-487.000.
Sommer, Oswin: *See*—
Bosch, Erhard; Craubner, Ingo; Dorsch, Norman; Schiller, August; and Sommer, Oswin, 4,399,267, Cl. 528-30.000.
Sonns, Eugen, to Deere & Company. Shift lever assembly. 4,398,433, Cl. 74-475.000.
Sonoda, Masakazu: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,399,473, Cl. 360-10.300.
Sony Corporation: *See*—
Kakiuchi, Tsutomu; and Kamon, Yoshiyuki, 4,399,334, Cl. 179-180.000.
Ohsawa, Kenji; Ito, Takao; Tanno, Koichiro; Ohsawa, Masayuki; and Kurata, Keiji, 4,398,975, Cl. 148-400.000.
Suzuki, Kiyoshi, 4,399,528, Cl. 369-77.000.
Sottini, Stefano: *See*—
Righini, Giancarlo; Russo, Vera; and Sottini, Stefano, 4,398,790, Cl. 350-96.180.
Soulier, Charles: *See*—
Duret, Jean; Soulier, Charles; and Trouillet, Georges, 4,398,756, Cl. 285-334.000.
Southard, Gary D., to Siemens Corporation. Digital tone generator. 4,399,535, Cl. 370-110.200.
Southwire Company: *See*—
Thomas, O. Leon, 4,398,973, Cl. 148-154.000.
Sparton Corporation: *See*—
Douglas, Norman F., 4,399,440, Cl. 340-870.260.
Neese, James A., 4,399,427, Cl. 340-388.000.
Sperry Corporation: *See*—
Krawczak, John A.; and Torok, Ernest J., 4,398,798, Cl. 350-162.240.
Wesner, Charles R., 4,398,353, Cl. 33-363.00R.
Sperry, John S.: *See*—
Krajicek, Richard W.; and Sperry, John S., 4,398,604, Cl. 166-303.000.
Spitz, Melvin P., to Kinematic Industries, Inc. Folding sofa-bed mechanism. 4,398,311, Cl. 5-13.000.
Sprague Electric Company: *See*—
Markarian, Paul M., 4,398,782, Cl. 339-147.00C.
Ross, Sidney D., 4,399,489, Cl. 361-433.000.
Sprangers, Wilhelmus; and Dijkstra, Rinse, to U.S. Philips Corporation. Method of producing mouldings and layers of inorganic materials. 4,399,090, Cl. 264-63.000.
Sproul, William W., III: *See*—
Cosgrove, Michael R., deceased; Frey, Alexander H., Jr.; Moore, Kenneth A.; Peled, Abraham; Ris, Frederic N.; and Sproul, William W., III, 4,399,507, Cl. 364-200.000.
Square D Company: *See*—
Jurek, Dennis J., 4,399,511, Cl. 364-477.000.
Palmer, Neil R.; and Winter, John M., 4,399,420, Cl. 335-21.000.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Perfluorodioxole and its polymers. 4,399,264, Cl. 526-247.000.
Srivastava, Gopal K., to Zenith Radio Corporation. Odd number frequency division with symmetrical output. 4,399,549, Cl. 377-108.000.
SSK Corporation: *See*—
McKiel, Charles W., Jr., 4,398,475, Cl. 110-346.000.
Stach, Leonard J.; and Wu, Frank, to Velsicol Chemical Corporation. N-Acylated lactams and their herbicidal compositions and method of use. 4,398,938, Cl. 71-88.000.
Stahl, Theo: *See*—
B/ler, Ulrich; Ribka, Joachim; Roth, Kurt; and Stahl, Theo, 4,398,913, Cl. 8-456.000.
Stall, Richard A.; Wood, Colin E. C.; and Eastman, Lester F., to United States of America, Navy. Method for making non-alloyed heterojunction ohmic contacts. 4,398,963, Cl. 148-1.500.
Standard Change-Makers, Inc.: *See*—
Shireman, Phillip E., 4,398,550, Cl. 133-1.00A.
Standard Oil Company, The: *See*—
Bennett, Phillip D., 4,399,203, Cl. 429-191.000.
Standard Oil Company (Indiana): *See*—
Cahill, Paul J., 4,398,505, Cl. 123-1.00A.
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,399,057, Cl. 252-435.000.
Nolte, Kenneth G., 4,398,416, Cl. 73-155.000.
Stannard, Forrest B.; and Highstreet, Edward J., to Dehydro Corporation, The. Filter devices and methods. 4,399,042, Cl. 210-791.000.
Stansfield, James F.; Toole, James; and Topham, Arthur, to Imperial Chemical Industries PLC. Dispersions. 4,398,955, Cl. 106-23.000.
Stanulonis, John J.; Tabacek, Joseph A.; and Vogel, Roger F., to Gulf Research & Development Company. Impregnating solution for hydrogenation catalyst manufacture and production thereof. 4,399,058, Cl. 252-438.000.
Stauffer Chemical Company: *See*—
Schwartz, Robert D.; and Bodie, Elizabeth A., 4,399,160, Cl. 426-41.000.
Ste Look: *See*—
Bernard, Jean; Beyl, Jean J. A.; Buzon, Philippe; and le Faou, Daniel, 4,398,747, Cl. 280-630.000.
Steel, Margaret L.: *See*—
Gillett, John E.; Isherwood, John; Hann, Richard A.; Norton-Berry, Philip; and Steel, Margaret L., 4,398,493, Cl. 118-303.000.
Steiner, Gerd; Gries, Josef; and Lenke, Dieter, to BASF Aktiengesellschaft. 6-Imidazol-1-yl-3-hydrazino-pyridazines, their preparation and antihypertensive use. 4,399,137, Cl. 424-250.000.
Steiner, Gerd; Friedrich, Ludwig; and Lenke, Dieter, to BASF Aktiengesellschaft. 5,6-Dihydro-11-alkylene-morphanthridin-6-ones, their pharmaceutical compositions and method of use. 4,399,139, Cl. 424-250.000.
Steinmetz, John H.: *See*—
Cholakian, Gary H.; Rubinstein, Arthur; and Steinmetz, John H., 4,399,538, Cl. 371-66.000.
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Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelte, David J., 4,399,534, Cl. 370-63.000.
Stephens, Frank M., Jr. Process for producing a ferronickel alloy from nickel bearing laterites. 4,398,945, Cl. 75-11.000.
Stephenson, Donald L., to Calspan Corporation. Dark current compensating lens iris control. 4,399,466, Cl. 358-228.000.
Sterling Drug Inc.: *See*—
Ambrosiano, Nicholas A.; and Kassner, James E., 4,398,916, Cl. 8-602.000.
Schmidt, Paul J.; and Jefferies, Patrick J., 4,399,291, Cl. 549-308.000.
Stetter, Jorg: *See*—
Jautelat, Manfred; Stetter, Jorg; and Arlt, Dieter, 4,399,309, Cl. 568-322.000.
Steuck, Roger A.: *See*—
Crawford, Steven C.; Feltman, Thomas J.; and Steuck, Roger A., 4,398,698, Cl. 254-291.000.
Steward, Erle R. Instrument for measuring angles. 4,398,821, Cl. 356-152.000.
Stoeger, Klaus: *See*—
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,399,018, Cl. 204-199.000.
Stolfo, John J., to Mead Corporation, The. Microcapsular coating composition containing a hydrophobic silica. 4,398,954, Cl. 106-21.000.
Stone, Barry N.: *See*—
Riederer, Stephen J.; Keyes, Gary S.; and Stone, Barry N., 4,399,457, Cl. 358-111.000.
Stone, Frank, Jr.: *See*—
Gamble, Clarence M.; and Stone, Frank, Jr., 4,398,367, Cl. 42-1.00N.
Stone, Orison W., to Pack Image, Inc. Handle for carrier. 4,398,632, Cl. 206-427.000.
Storm, William F., to Cherry Electrical Products Corporation. Electrical contact. 4,399,339, Cl. 200-264.000.
Stouffer, Ronald D., to Bowles Fluidic Corporation. Fluid oscillator device and method. 4,398,664, Cl. 239-11.000.
Strandberg, Charles F., Jr.; and Strandberg, Robert C., to Strandberg Engineering Laboratories, Inc. Microwave moisture measuring, indicating and control apparatus. 4,399,403, Cl. 324-58.50A.
Strandberg Engineering Laboratories, Inc.: *See*—
Strandberg, Charles F., Jr.; and Strandberg, Robert C., 4,399,403, Cl. 324-58.50A.
Strandberg, Robert C.: *See*—
Strandberg, Charles F., Jr.; and Strandberg, Robert C., 4,399,403, Cl. 324-58.50A.
Straubel, Max: *See*—
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Strickland, Jimmy P.: *See*—
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Stride Rite International, Ltd.: *See*—
Batra, Vijay K., 4,398,357, Cl. 36-30.00A.

Strnad, Raymond J.: *See*—
Scott, Ernest R.; and Strnad, Raymond J., 4,398,316, Cl. 15-332.000.

Stuckmann, Dieter; and Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 4,398,845, Cl. 405-145.000.

Studtmann, Rainer, to Schubert & Salzer. Pivotable spindle mounting. 4,398,385, Cl. 57-18.000.

Stuhler, Herbert: *See*—
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Subramaniam, Ambati, to NCR Canada Ltd. Method and apparatus for image data compression and decompression. 4,399,467, Cl. 358-261.000.

Suchanski, Mary R.: *See*—
Branchick, Kenneth J.; Malkin, Irving; Sutter, Robert C.; Korinek, Karel A.; Suchanski, Mary R.; Knaack, Donald M.; and Platek, Gary F., 4,399,020, Cl. 204-269.000.

Sud-Chemie A.G.: *See*—
Schneider, Michael; Kochloefl, Karl; Diez, Gerhard; Maier, Franz; Rauch, Josef E.; and Liebelt, Wolfgang, 4,399,350, Cl. 219-388.000.

Sudano, John J.: *See*—
Nelson, Alfred M.; Rasekhi, Houshang; and Sudano, John J., 4,399,422, Cl. 335-284.000.

Sugihara, Shigeharu: *See*—
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Sugimori, Shigeru; Honda, Yukio; and Kojima, Tetsuhiko, to Chisso Corporation. Carboxylic acid ester derivatives of 4-fluorophenol. 4,399,298, Cl. 560-59.000.

Sugino, Morihiko, to Kabushiki Kaisha Kobe Seiko Sho. Activated carbonaceous honeycomb body and production method thereof. 4,399,052, Cl. 252-421.000.

Sugita, Ryuji; and Kunieda, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Method of producing a magnetic recording medium. 4,399,013, Cl. 204-192.00N.

Sukegawa, Hiromu; and Tomisawa, Yoshiaki, to Hitachi Chemical Company, Limited. Pressure seal structure and pressure sealed transfer mechanism. 4,398,728, Cl. 277-12.000.

Sukhushin, Anatoly V.: *See*—
Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Sukhushin, Anatoly V.; Chepurnoi, Nikolai P.; and Cherednikov, Evgeny N., 4,398,609, Cl. 175-19.000.

Sullivan, John D.; Moore, Larry G.; and Taylor, James K., to IRD Mechanalysis, Inc. Machine monitoring system and apparatus. 4,399,513, Cl. 364-551.000.

Sumegi, Endre: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Sumida, Seizo: *See*—
Ichiki, Takemoto; Yoshida, Ryo; Sumida, Seizo; and Katsuzo, Kamoshita, 4,399,072, Cl. 260-453.0RW.

Suminoe, Taro: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Ichiki, Takemoto; Yoshida, Ryo; Sumida, Seizo; and Katsuzo, Kamoshita, 4,399,072, Cl. 260-453.0RW.

Sun Studs, Inc.: *See*—
Sohn, Fred; and Shrum, Kenneth L., 4,398,580, Cl. 144-357.000.

Sunbeam Corporation: *See*—
Augustine, Robert J.; and Mysicka, James C., 4,398,364, Cl. 38-77.500.

Suncor, Inc.: *See*—
Yong, Raymond N., 4,399,038, Cl. 210-728.000.
Yong, Raymond N., 4,399,039, Cl. 210-728.000.

Sunesson, Bengt S., to Lyft-och Surrningsredskap AB. Lashing sling fastening buckle. 4,398,321, Cl. 24-196.000.

Suni, Jukka: *See*—
Suovaniemi, Osmo A.; Tervamaki, Jukka; Suni, Jukka; and Partanen, Paul, 4,398,382, Cl. 53-431.000.

Sunset Ltd.: *See*—
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Guibert, Raul, 4,399,159, Cl. 426-113.000.

Suntory Limited: *See*—
Ueda, Toshihiro; Imanishi, Masamichi; and Miyano, Takayoshi, 4,398,652, Cl. 222-1.000.

Suovaniemi, Osmo A.; Tervamaki, Jukka; Suni, Jukka; and Partanen, Paul, to Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi. Method for washing and coating as well as for dosage of EIA-rings and a device for carrying out the method. 4,398,382, Cl. 53-431.000.

Supertex, Inc.: *See*—
Blanchard, Richard A.; and Choy, Benedict C. K., 4,398,339, Cl. 29-571.000.

Sutter, Robert C.: *See*—
Branchick, Kenneth J.; Malkin, Irving; Sutter, Robert C.; Korinek, Karel A.; Suchanski, Mary R.; Knaack, Donald M.; and Platek, Gary F., 4,399,020, Cl. 204-269.000.

Suzuka, Teruo; Inoue, Yukio; Aizawa, Shirou; Ishibashi, Yasushi; and Ohse, Hidetaka, to Research Association for Residual Oil Processing. Process for simultaneously cracking heavy hydrocarbons into light oils and producing hydrogen. 4,399,023, Cl. 208-112.000.

Suzuki, Akira; Shioya, Yasumi; and Kimura, Keiichi, to Shinryo Air Conditioning Co., Ltd. Method for incinerating sewage sludge. 4,398,476, Cl. 110-346.000.

Suzuki, Hajime; Umemura, Yoshifumi; and Tanaka, Shigeru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for supporting a heald frame in a weaving loom. 4,398,569, Cl. 139-88.000.

Suzuki, Hajime; Iwano, Yoshimi; and Arakawa, Akio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Weft yarn detector. 4,398,570, Cl. 139-370.200.

Suzuki, Kiyoshi, to Sony Corporation. Automatic eject apparatus for a self-contained record player. 4,399,528, Cl. 369-77.000.

Suzuki, Tomosaburo; and Wakahara, Akira, to Kabushiki Kaisha Daisei Kikai. Binding method using adhesive tape. 4,398,983, Cl. 156-185.000.

Swank, Robert P., to Champion Spark Plug Company. Humidifier apparatus. 4,399,080, Cl. 261-80.000.

Swanson, Dail L.: *See*—
Hammer, Edward E.; Lemmers, Eugene; and Swanson, Dail L., 4,399,391, Cl. 315-244.000.

Sweeney, William J., III. Insertion device for a diaphragm. 4,398,532, Cl. 128-127.000.

Sweka, Jonathan L.: *See*—
VanSice, William S.; Sweka, Jonathan L.; and Marshall, Keith G., 4,398,435, Cl. 74-612.000.

Swift, David W., to Pilkington P.E. Limited. Head-up displays. 4,398,799, Cl. 350-174.000.

Swift, Gregory W.: *See*—
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,398,398, Cl. 62-467.00R.

Swift, Stephen J.: *See*—
Nappholz, Tibor A.; and Swift, Stephen J., 4,398,536, Cl. 128-419.0PG.

Swiss Aluminium Ltd.: *See*—
Walter, Juris, 4,399,086, Cl. 264-45.500.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, 4,399,069, Cl. 260-239.30P.

Szabo, Laszlo J.: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Kreidl, Janos; Farkas nee Kirjak, Maria; Nemes, Andras; and Cibula, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Process for an enantioselective synthesis of optically active 14-oxo-E-homo-eburnane derivatives. 4,399,069, Cl. 260-239.30P.

Szell nee Hasenohrl, Erzsebet: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,399,065, Cl. 260-112.50R.

Szeto, Whalun: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,399,344, Cl. 219-68.000.

Szilagyi, Dezso; Cunningham, John P.; and Bowlby, Robert L., to General Signal Corp. Butterfly valve. 4,398,696, Cl. 251-307.000.

Szpitalak, Wesley J.: *See*—
Fridl, James J.; Nonnemann, Heinz W.; Payne, Robert D.; and Szpitalak, Wesley J., 4,398,491, Cl. 116-67.00R.

Tabacek, Joseph A.: *See*—
Stanulonis, John J.; Tabacek, Joseph A.; and Vogel, Roger F., 4,399,058, Cl. 252-438.000.

Tabares, Gilbert. Protective guard devices for use with automotive vehicles. 4,398,758, Cl. 293-128.000.

Tabata, Yasuhiro: *See*—
Satomi, Toyokazu; Kanmoto, Yoshiaki; and Tabata, Yasuhiro, 4,399,431, Cl. 340-568.000.

Tabe, Yutaka: *See*—
Sasaki, Hideharu; Nakamura, Tsutomu; Shimada, Keizo; Aito, Yuzo; and Tabe, Yutaka, 4,398,995, Cl. 162-157.300.

Tack, Andre A.; and Dijkstra, Albert J., to SAFINCO n.v. Frying oil composition and process of production. 4,399,165, Cl. 426-613.000.

Taco Operations, Inc.: *See*—
Bernal, Eddle L., 4,399,156, Cl. 426-91.000.

Tacoma Products, Inc.: *See*—
Darling, Stephen D.; Jendrisak, Aloysius A.; and Bokmiller, David J., 4,398,888, Cl. 434-278.000.

Tag Radionics Limited: *See*—
Falck, John B.; and Robson, David, 4,399,437, Cl. 340-825.540.

Takahashi, Fuminobu, to Hitachi, Ltd. Ultrasonic signal processing apparatus. 4,398,423, Cl. 73-631.000.

Takahashi, Fumio; and Miura, Yuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Marking apparatus for plastic encapsulated semiconductor devices. 4,398,457, Cl. 101-44.000.

Takahashi, Hiroyoshi: *See*—
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,398,876, Cl. 425-143.000.

Takamura, Yoshio: *See*—
Onodera, Toshihiro; Inomata, Koichiro; Hasegawa, Michio; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,399,376, Cl. 307-415.000.

Takamura, Yoshiyuki, to Fuji Pack System Ltd. Packing apparatus. 4,398,380, Cl. 53-390.000.

Takasu, Yoshio; Takebayashi, Norie; Sakai, Kiyoshi; Mabuchi, Minoru; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,399,208, Cl. 430-59.000.

Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,399,133, Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. Cephem compounds. 4,399,133, Cl. 424-246.000.

Takaya, Takao; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. 7-Amino-3-phosphonocephalosporanic acid compounds. 4,399,277, Cl. 544-016.000.

Takayama, Toshio; and Ando, Hiromi, to Tokico Ltd. Pneumatic servo booster. 4,398,449, Cl. 91-376.00R.

Take, Hiroshi: *See—*
Hamada, Hiroshi; Yano, Kohzo; Koyanagi, Katubumi; Take, Hiroshi; and Inami, Yasuhiko, 4,399,436, Cl. 340-812.000.

Takebayashi, Norie: *See—*
Takasu, Yoshio; Takebayashi, Norie; Sakai, Kiyoshi; Mabuchi, Minoru; and Ishikawa, Shozo, 4,399,208, Cl. 430-59.000.

Takei, Hideo: *See—*
Tsukada, Tsutomu; and Takei, Hideo, 4,399,016, Cl. 204-192.00R.

Takemura, Yasuhiko; and Okazaki, Takahisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Compound mode ultrasound diagnosis apparatus. 4,398,540, Cl. 128-660.000.

Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, to Mitsubishi Jukogyo Kabuchiki Kaisha. Rolls for single facer. 4,398,328, Cl. 29-126.000.

Takeuchi, Yoshio: *See—*
Yasufuku, Yoshitaka; Takeuchi, Yoshio; and Kimura, Yoshiaki, 4,399,443, Cl. 346-1.100.

Taki, Yoichiro: *See—*
Ona, Isao; Ozaki, Masaru; Usui, Katsutoshi; and Taki, Yoichiro, 4,399,247, Cl. 524-204.000.

Takihara, Yukio, to Hosiden Electronics Co., Ltd. Jack assembly structure. 4,398,784, Cl. 339-182.00R.

Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, to Nikki-Universal Co., Ltd. Manufacture of spherical alumina from gibbsite. 4,399,119, Cl. 423-626.000.

Talvensaari, Robert D., to Copper Range Company. Roof bolter and process. 4,398,850, Cl. 405-261.000.

Tan, Khen-Sang. On board self-calibration of analog-to-digital and digital-to-analog converters. 4,399,426, Cl. 340-347.0CC.

Tanabe, Akiyoshi: *See—*
Fukuda, Masahito; Tanabe, Akiyoshi; Moriguchi, Yasuo; Nagai, Nobuyuki; Tsuji, Kunio; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Mizuta, Atsuo, 4,398,406, Cl. 72-42.000.

Tanaka, Kanji; and Usui, Noboru, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Demodulating circuit for controlling stereo separation. 4,399,325, Cl. 179-1.0GM.

Tanaka, Kazunori; Nagata, Yukio; Miura, Toshikatu; and Okada, Yukio, to Nissan Motor Company, Limited. Reinforcing material. 4,399,174, Cl. 428-67.000.

Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,398,833, Cl. 368-156.000.

Tanaka, Motoaki: *See—*
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,399,213, Cl. 430-523.000.

Tanaka, Shigeru: *See—*
Suzuki, Hajime; Umemura, Yoshifumi; and Tanaka, Shigeru, 4,398,569, Cl. 139-88.000.

Tanaka, Yoshiro; Fujii, Noritsugu; Akagi, Kazuo; and Shitamatsu, Ryujiro, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for pickling the inner wall of tubular material. 4,398,552, Cl. 134-57.00R.

Tanasawa, Yasusi; Hayashi, Tadakuni; and Muto, Norio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Internal combustion engine. 4,398,513, Cl. 123-255.000.

Tanimoto, Masafumi; Ieda, Nobuaki; and Wada, Masato, to Nippon Telegraph and Telephone Public Corporation. Integrated circuit having spare parts activated by a high-to-low adjustable resistance device. 4,399,372, Cl. 307-279.000.

Taninaka, Kuniaki: *See—*
Kajioka, Mitsuru; Okawa, Katsumasa; and Taninaka, Kuniaki, 4,398,943, Cl. 71-92.000.

Tanno, Koichiro: *See—*
Ohsawa, Kenji; Ito, Takao; Tanno, Koichiro; Ohsawa, Masayuki; and Kurata, Keiji, 4,398,975, Cl. 148-400.000.

Tansei, Hikaru; and Motomura, Kenichi, to Bridgestone Tire Company Limited. Pneumatic radial tires for heavy vehicles. 4,398,584, Cl. 152-362.0CS.

Task, Harry L.; Courtright, John F.; and Genco, Louis V., to United States of America, Air Force. Aerial day/night refueling stations. 4,398,685, Cl. 244-135.00A.

Task, Harry L. Two-axis angular deviation measurement system with target image rotating means. 4,398,822, Cl. 356-239.000.

Tatsushima, Masaru: *See—*
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,399,119, Cl. 423-626.000.

Taylor, Donald F., to Otis Engineering Corporation. Flow control valve. 4,398,555, Cl. 137-155.000.

Taylor, James K.: *See—*
Sullivan, John D.; Moore, Larry G.; and Taylor, James K., 4,399,513, Cl. 364-551.000.

Taylor, Lothar J., to Rockwell International Corporation. Circuit for operating a flight navigation indicator. 4,399,425, Cl. 340-27.0NA.

Taylor, Peter A., to Baker Perkins Holdings Limited. Sheeting of biscuit dough. 4,398,877, Cl. 425-145.000.

TBA Industrial Products Ltd.: *See—*
Willis, John H.; and Heath, Trevor C., 4,398,934, Cl. 65-2.000.

TDK Electronics Co., Ltd.: *See—*
Kohji, Toda, 4,399,387, Cl. 310-334.000.
Nakashima, Yutaka; and Okada, Akira, 4,399,189, Cl. 428-328.000.
Okano, Tadao, 4,398,462, Cl. 101-128.210.

Tedder, Daniel W., to Georgia Tech Research Institute. Process for producing absolute alcohol by solvent extraction and vacuum distillation. 4,399,000, Cl. 203-19.000.

Teichmann, Friedrich, to Triumph-Adler A.G. fur Buro- und Informationstechnik. Typewriter ribbon lifting and transporting device. 4,398,838, Cl. 400-212.000.

Teijin Limited: *See—*
Sagawa, Yasuhiko; Norota, Susumu; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,399,084, Cl. 264-27.000.
Sasaki, Hideharu; Nakamura, Tsutomu; Shimada, Keizo; Aito, Yuzo; and Tabe, Yutaka, 4,398,995, Cl. 162-157.300.

Teksid S.p.A.: *See—*
Mischiatti, Mario, 4,398,501, Cl. 122-7.00R.

Telectronics Pty. Ltd.: *See—*
Nappholz, Tibor A.; and Swift, Stephen J., 4,398,536, Cl. 128-419.0PG.

Teledyne Industries, Inc.: *See—*
Fienhold, Stephen C., 4,398,669, Cl. 239-447.000.

Teltec Inc.: *See—*
Gewitz, Steven; and Elia, Raymond Z. A., 4,399,333, Cl. 179-175.30F.

Ten Haken, Pieter; Naisby, Thomas W.; and Gray, Andrew C. G., to Shell Oil Company. Fungicides. 4,399,149, Cl. 424-309.000.

Terase, Kunihiko: *See—*
Sato, Kimihiko; Terase, Kunihiko; and Kijimuta, Hitoshi, 4,399,115, Cl. 423-344.000.

Terskov, Alexei D.: *See—*
Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Sukhushin, Anatoly V.; Chepurnoi, Nikolai P.; and Cherednikov, Evgeny N., 4,398,609, Cl. 175-19.000.

Tervamaki, Jukka: *See—*
Suovaniemi, Osmo A.; Tervamaki, Jukka; Suni, Jukka; and Partanen, Paul, 4,398,382, Cl. 53-431.000.

Texaco Development Corporation: *See—*
Child, Edward T., 4,399,314, Cl. 208-11.0LE.
Gillespie, Ronald G., 4,399,416, Cl. 330-86.000.

Texaco Inc.: *See—*
Canup, Robert E.; Mitchell, Edward; and Alperstein, Martin, deceased, 4,398,515, Cl. 123-357.000.
Duranleau, Roger G., 4,399,233, Cl. 518-701.000.
Haberman, John P., 4,398,597, Cl. 166-57.000.

Texas Instruments Incorporated: *See—*
Brown, Sammy K.; Solimeno, Duane; Koeppen, Peter L.; and Rogers, Gerald, 4,399,331, Cl. 179-5.00R.
Niehaus, Jeffrey A.; and Ovens, Kevin M., 4,399,517, Cl. 364-784.000.
Nield, Joseph G., 4,399,423, Cl. 337-102.000.

Texas Long Life Tool Co., Inc.: *See—*
Odom, Robert L., 4,398,898, Cl. 464-20.000.

Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, to Lotte Co., Ltd. Combination of frozen dessert and stick chewing gum. 4,399,153, Cl. 426-5.000.

Thalmair, Korbinian: *See—*
Sepp, Gunther; Diehl, Christian; Bogenberger, Richard; Born, Gunthard; Mohr, Friedbert; Schmidt, Roland; Schnaebele, Werner; and Thalmair, Korbinian, 4,398,466, Cl. 102-427.000.

Thayer, Bruce E., to Xerox Corporation. Cleaning system. 4,398,820, Cl. 355-15.000.

Thelander, Sidsel: *See—*
Karlberg, Bo I.; and Thelander, Sidsel, 4,399,102, Cl. 422-82.000.

Theriault, Gerald E., to RCA Corporation. Voltage controlled tuner with voltage variable frequency selective arrangements controlled in response to a control voltage generated independently of the tuning voltage. 4,399,559, Cl. 455-179.000.

Thiella, Francesco: *See—*
Furlan, Antonio; Thiella, Francesco; and Tibaldo, Flavio, 4,399,332, Cl. 179-8.00A.

Thierbach, Mark E.: *See—*
Blahut, Donald E.; Harrison, Marc L.; Killian, Michael J.; and Thierbach, Mark E., 4,399,516, Cl. 364-716.000.

Thies, Peter, to Wagener Schwelm GmbH & Co. Heating platen for a belt press. 4,398,991, Cl. 156-583.100.

Thiokol Corporation: *See—*
Guziec, Frank S., Jr., 4,399,281, Cl. 546-9.000.
Wade, Robert C., 4,399,238, Cl. 521-82.000.

Thoemel, Frank; Seib, Karl; Schneider, Kurt; and Naegele, Paul, to BASF Aktiengesellschaft. Polyalkoxycarbinol cinnamates and protective sun agents containing these compounds. 4,399,297, Cl. 560-55.000.

Thomanetz, Erwin, to Herko Pyrolyse GmbH & Co. Recycling KG. Device and method for pyrolyzing waste materials. 4,398,471, Cl. 110-235.000.

Thomas, Daniel C.: *See—*
Dixit, Sunit S.; and Thomas, Daniel C., 4,399,243, Cl. 524-55.000.

Thomas, Louis N. Hair frosting purse. 4,398,549, Cl. 132-9.000.

Thomas, O. Leon, to Southwire Company. Traverse annealer. 4,398,973, Cl. 148-154.000.

Thomas, Rudy V., to Allied Corporation. Emergency release mechanism for passive seat belt systems. 4,398,750, Cl. 280-802.000.

Thomas, William R. I.: *See*—
Lyon, Richard K.; Eisner, Philip N.; and Thomas, William R. I., 4,399,010, Cl. 204-157.10R.
Thome, William L., to Midland-Ross Corporation. Annealing furnace with an improved cooling section. 4,398,700, Cl. 266-111.000.
Thompson, David, to AEL Microtel, Ltd. Apparatus for testing the linearity of a frequency modulated oscillator. 4,399,409, Cl. 324-78.00Z.
Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., to Chevron Research Company. Method for interpreting well log records to yield indications of gas/oil in an earth formation such as a sandstone, limestone, or dolostone. 4,399,525, Cl. 367-75.000.
Thomson-CSF: *See*—
Fleury, Georges; and Payen, Francis, 4,399,389, Cl. 315-3.500.
Leterme, Dominique; and Le Merer, Jean P., 4,399,529, Cl. 369-110.000.
Thrush, Edward J.: *See*—
Pitt, Gillies D.; Greene, Peter D.; Thrush, Edward J.; and Whysall, David H., 4,398,342, Cl. 29-580.000.
Thuillier, Jean: *See*—
Godfroid, Jean-Jacques; and Thuillier, Jean, 4,399,299, Cl. 560-63.000.
Tibaldo, Flavio: *See*—
Furlan, Antonio; Thiella, Francesco; and Tibaldo, Flavio, 4,399,332, Cl. 179-8.00A.
Tibika, Francoise: *See*—
Sarig, Sara; Garti, Nissim; and Tibika, Francoise, 4,399,003, Cl. 204-1.00T.
Tickle, Andrew C.; and Vora, Madhukar B., to Fairchild Camera & Instrument Corp. Fabrication of high speed, nonvolatile, electrically erasable memory cell and system utilizing selective masking, deposition and etching techniques. 4,398,338, Cl. 29-571.000.
TII Electronics, Inc.: *See*—
Santini, John, 4,399,393, Cl. 318-313.000.
Tilgner, Peter; Wingard, Robert D.; Leida, Shirley M.; and Erwin, Kenneth L., Jr., to Upjohn Company, The. Programmable computer controlled reaction injection mixing head system. 4,399,105, Cl. 422-111.000.
Ting, Vincent W.; Woo, James T. K.; and Marcinko, Richard M., to SCM Corporation. Base for a graft polymer, novel graft polymer compositions, solvents and water-reducible coatings incorporating the novel graft polymers, and processes for making them. 4,399,241, Cl. 523-400.000.
Tissot, Raymond; Leblanc, Jean; and Pigeroulet, Jean, to Robert-Bosch GmbH. Fuel injection apparatus for internal combustion engines, in particular for diesel engines. 4,398,519, Cl. 123-446.000.
Titus, Theodore, IV; and Bagley, Julius B., to Lanier Business Products, Inc. Dictation display device. 4,399,527, Cl. 369-28.000.
Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Controlled release granules. 4,399,122, Cl. 424-21.000.
Toda, Minoru: *See*—
Osaka, Susumu; and Toda, Minoru, 4,399,385, Cl. 310-328.000.
Osaka, Susumu; and Toda, Minoru, 4,399,386, Cl. 310-328.000.
Todd, Martin H.: *See*—
Gowers, Elizabeth; and Todd, Martin H., 4,399,129, Cl. 424-244.000.
Toeppen, Thurston. Closure for pressurized containers. 4,398,645, Cl. 215-252.000.
Toki, Tsukasa: *See*—
Yoshinaka, Shigeo; Toki, Tsukasa; Wakatsuki, Misuzu; and Uchiyama, Seiji, 4,399,311, Cl. 568-437.000.
Tokico Ltd.: *See*—
Takayama, Toshio; and Ando, Hiromi, 4,398,449, Cl. 91-376.00R.
Tokiyasu, Kouichi: *See*—
Takenaka, Hiroyuki; Katayama, Keiichi; Tokiyasu, Kouichi; Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,398,328, Cl. 29-126.000.
Tokuta, Yoshio: *See*—
Nakajima, Yoshio; Moriya, Takaharu; Nakamura, Hajime; Omosako, Koji; and Tokuta, Yoshio, 4,399,022, Cl. 204-422.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Tanaka, Kanji; and Usui, Noboru, 4,399,325, Cl. 179-1.0GM.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Shoji; Segawa, Makoto; Maiwa, Hisaaki; and Okamoto, Seishi, 4,399,520, Cl. 365-174.000.
Hamano, Eizaburo; Koshigoe, Shinpei; and Kamohara, Eiji, 4,399,388, Cl. 313-414.000.
Iida, Tatsuo, 4,399,315, Cl. 174-21.00C.
Kanazawa, Mamoru, 4,398,962, Cl. 148-1.500.
Mizuno, Sakuyuki, 4,399,468, Cl. 358-280.000.
Nakashima, Kazuyuki; Araki, Youichi; Igarashi, Yukio; and Kojima, Shinjiro, 4,399,452, Cl. 357-74.000.
Nishimura, Fuminobu; and Kohyama, Mitsuaki, 4,398,817, Cl. 355-4.000.
Onodera, Toshihiro; Inomata, Koichiro; Hasegawa, Michio; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,399,376, Cl. 307-415.000.
Takahashi, Fumio; and Miura, Yuji, 4,398,457, Cl. 101-44.000.
Takemura, Yasuhiko; and Okazaki, Takahisa, 4,398,540, Cl. 128-660.000.
Tokyo Tokushu Insatsu Kogyo Kabushiki Kaisha: *See*—
Ozasa, Tetsuya, 4,399,177, Cl. 428-199.000.
Tomisawa, Yoshiaki: *See*—
Sukegawa, Hiromu; and Tomisawa, Yoshiaki, 4,398,728, Cl. 277-12.000.
Tomomitsu, Osahiko: *See*—
Matsumura, Yoshio; Nozue, Ikuo; Tomomitsu, Osahiko; Ukachi, Takashi; and Suminoe, Taro, 4,399,266, Cl. 528-10.000.
Tomordi, Elemer: *See*—
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.
Tomy Kogyo Co., Inc.: *See*—
Nishimiya, Toru; and Kurita, Toshiaki, 4,398,719, Cl. 273-138.00R.
Toole, James: *See*—
Stansfield, James F.; Toole, James; and Topham, Arthur, 4,398,955, Cl. 106-23.000.
Toolmark Co.: *See*—
Holdahl, Robert A.; and Petersen, Paul S., 4,398,579, Cl. 142-53.000.
Top-Scor Products, Inc.: *See*—
Forsythe, Curtis J., 4,399,155, Cl. 426-24.000.
Topham, Arthur: *See*—
Stansfield, James F.; Toole, James; and Topham, Arthur, 4,398,955, Cl. 106-23.000.
Toray Industries, Inc.: *See*—
Endo, Tetsuhiko; Ueda, Kunihiko; and Kohara, Tadashi, 4,398,386, Cl. 57-288.000.
Imamura, Shinzo; Sato, Haruyo; and Kuramoto, Hiroyoshi, 4,399,289, Cl. 548-507.000.
Minami, Satoyuki; Nagata, Ryuichi; and Otaki, Toshihiro, 4,399,179, Cl. 428-212.000.
Toray Silicone Company, Ltd.: *See*—
Ona, Isao; Ozaki, Masaru; Usui, Katsutoshi; and Taki, Yoichiro, 4,399,247, Cl. 524-204.000.
Torche, Michael P., to MCC Flowseal. Metal seal structure. 4,398,695, Cl. 251-306.000.
Torii, Akio: *See*—
Hattori, Katsuhide; Fukatsu, Yoshiaki; and Torii, Akio, 4,398,976, Cl. 149-21.000.
Torii, Hiroshi; and Mori, Masaharu, to Brother Kogyo Kabushiki Kaisha. Printing apparatus and method for preventing printing errors in same. 4,398,837, Cl. 400-74.000.
Toro Company, The: *See*—
Hunter, Edwin J., 4,398,666, Cl. 239-222.130.
Torok, Ernest J.: *See*—
Krawczak, John A.; and Torok, Ernest J., 4,398,798, Cl. 350-162.240.
Torrington Company, The: *See*—
Murphy, William W., 4,398,777, Cl. 308-207.00R.
Tosaka, Susumu; Abe, Tadamichi; Endo, Hozumi; and Ogawa, Kiyohiro, to Mitsubishi Light Metal Industries Limited. Process for treating a gas containing a fluorine compound. 4,399,113, Cl. 423-240.000.
Totsuka, Kaoru: *See*—
Yamamoto, Makoto; Miyaji, Naotaka; Ishigaki, Yukinobu; and Totsuka, Kaoru, 4,399,327, Cl. 179-1.0DM.
Tour & Andersson Aktiebolag: *See*—
Hegberg, Richard A., 4,398,663, Cl. 237-9.00R.
Townsend, Clyde D. Apparatus for supporting a working platform on a pitched roof. 4,398,620, Cl. 182-45.000.
Toy, Walter W.: *See*—
Smith, Frederick R.; Toy, Walter W.; and Witiak, David, 4,399,255, Cl. 525-54.210.
Toyama, Akira, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Character reader. 4,399,553, Cl. 382-7.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Okudaira, Tadashi; Tsuboi, Akio; Sugihara, Shigeharu; and Hama, Yoshihisa, 4,398,642, Cl. 215-1.00C.
Toyo Seikan Kaisha, Ltd.: *See*—
Kawashima, Masayoshi; and Yuasa, Akio, 4,398,875, Cl. 425-127.000.
Toyomasu, Ryuta: *See*—
Matsuishi, Tsutomu; Maruyama, Hiromasa; Kitahara, Toshio; Kabashima, Akemi; and Toyomasu, Ryuta, 4,399,304, Cl. 562-445.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kuroiwa, Yosio; Kato, Keigo; and Ando, Masahisa, 4,398,522, Cl. 123-549.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ogawa, Hisashi; and Tsuge, Hiroshi, 4,398,680, Cl. 242-107.200.
Traynor, Thomas H.: *See*—
Balopole, Harvey L.; and Traynor, Thomas H., 4,399,462, Cl. 358-183.000.
Treiber, Laszlo R.: *See*—
Goegelman, Robert T.; and Treiber, Laszlo R., 4,399,274, Cl. 536-7.100.
Triad Corporation: *See*—
Damratowski, Harold E., 4,398,694, Cl. 251-145.000.
Trinh, Eugene H.; Elleman, Daniel D.; and Wang, Taylor G., to United States of America, National Aeronautics and Space Administration. Acoustic bubble removal method. 4,398,925, Cl. 55-15.000.
Trinity Lutheran Hospital: *See*—
Fleenor, Jonathan T.; Long, George W., Jr.; and Dawson, John M., 4,398,872, Cl. 417-360.000.
Trio Kabushiki Kaisha: *See*—
Shimomae, Katsuro, 4,399,475, Cl. 360-96.300.
Triumph-Adler A.G. fur Buro- und Informationstechnik: *See*—
Teichmann, Friedrich, 4,398,838, Cl. 400-212.000.

Troffkin, Howard J.: *See—*
Rosenberg, Arnold M.; Gaidis, James M.; and Troffkin, Howard J., 4,398,959, Cl. 106-90.000.

Troncoso, Fernando, Jr. Archery bow assembly. 4,398,528, Cl. 124-24.00R.

Troster, Manfred: *See—*
Hofmann, Heinrich; Markfelder, Gunter; and Troster, Manfred, 4,398,775, Cl. 308-201.000.

Trouillet, Georges: *See—*
Duret, Jean; Soulier, Charles; and Trouillet, Georges, 4,398,756, Cl. 285-334.000.

True, Robert M.: *See—*
DeSantis, Charles M.; and True, Robert M., 4,399,442, Cl. 343-100.0SA.

Tsuboi, Akio: *See—*
Okudaira, Tadashi; Tsuboi, Akio; Sugihara, Shigeharu; and Hama, Yoshihisa, 4,398,642, Cl. 215-1.00C.

Tsuge, Hiroshi: *See—*
Ogawa, Hisashi; and Tsuge, Hiroshi, 4,398,680, Cl. 242-107.200.

Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,399,133, Cl. 424-246.000.

Tsuji, Kunio: *See—*
Fukuda, Masahito; Tanabe, Akiyoshi; Moriguchi, Yasuo; Nagai, Nobuyuki; Tsuji, Kunio; Yamaguchi, Yoshihiro; Matsushita, Tomiharu; and Mizuta, Atsuo, 4,398,406, Cl. 72-42.000.

Tsujimoto, Michihiro: *See—*
Asano, Makoto; Hasegawa, Kiyoharu; Akahori, Hiroyuki; and Tsujimoto, Michihiro, 4,398,753, Cl. 282-27.500.

Tsukada, Tsutomu; and Takei, Hideo, to Anelva Corporation. Plasma device comprising an intermediate electrode out of contact with a high frequency electrode to induce electrostatic attraction. 4,399,016, Cl. 204-192.00R.

Tubbs, Steven J.: *See—*
Feinleib, Julius M.; Bowker, John K.; Schmutz, Lawrence E.; Tubbs, Steven J.; and Shao, Michael, 4,399,356, Cl. 250-201.000.

Tusco, Inc.: *See—*
Everett, Lynn E., 4,398,766, Cl. 297-252.000.

UBE Industries, Ltd.: *See—*
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,399,232, Cl. 501-38.000.

Uchida, Naotaka: *See—*
Kurita, Yoshihiko; and Uchida, Naotaka, 4,399,493, Cl. 362-122.000.

Uchida, Youji: *See—*
Nakamura, Hisao; and Uchida, Youji, 4,399,161, Cl. 426-541.000.

Uchiyama, Seiji: *See—*
Yoshinaka, Shigeo; Toki, Tsukasa; Wakatsuki, Misuzu; and Uchiyama, Seiji, 4,399,311, Cl. 568-437.000.

Uchiyama, Toshihiko; Yoshida, Eizo; and Okuyama, Toshiki, to Nissan Motor Co., Ltd. Method of producing article having secondary part adhered to press-formed metal part. 4,398,984, Cl. 156-196.000.

Ueda, Ikuo; Kobayashi, Masakazu; Yamada, Hisashi; and Ono, Hiroki, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-2 or 3-cephem-4-carboxylic acid compounds. 4,399,278, Cl. 544-022.000.

Ueda, Kimio. Reactor for preparing uranium trioxide. 4,399,106, Cl. 422-140.000.

Ueda, Kunihiko: *See—*
Endo, Tetsuhiko; Ueda, Kunihiko; and Kohara, Tadashi, 4,398,386, Cl. 57-288.000.

Ueda, Shigeki, to Matsushita Electric Industrial Co., Ltd. Heating device with separate display means for the types of data entered. 4,399,352, Cl. 219-506.000.

Ueda, Toshihiro; Imanishi, Masamichi; and Miyano, Takayoshi, to Suntory Limited. Method and dispenser for dispensing beer. 4,398,652, Cl. 222-1.000.

Uede, Hisashi: *See—*
Endo, Yoshihiro; Yamashita, Yoshito; Kishishita, Hiroshi; and Uede, Hisashi, 4,399,015, Cl. 204-192.00P.

Ueno, Ryuzo; Matsuda, Toshio; and Inamine, Shigeo, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Sorbic acid-containing powder or granules. 4,399,150, Cl. 424-317.000.

Ueoka, Takahira: *See—*
Kojima, Hajime; Kurita, Yukio; Hirata, Kazuhiko; Nakagawa, Satoshi; and Ueoka, Takahira, 4,398,841, Cl. 403-173.000.

Ukachi, Takashi: *See—*
Matsumura, Yoshio; Nozue, Ikuo; Tomomitsu, Osahiko; Ukachi, Takashi; and Suminoe, Taro, 4,399,266, Cl. 528-10.000.

Ukai, Toshinao: *See—*
Kondo, Syunichi; Matsufuji, Akihiro; Umehara, Akira; Ukai, Toshinao; and Sato, Akira, 4,399,211, Cl. 430-269.000.

Ulrich, George W., to United States of America, Navy. Gun muzzle clamp. 4,398,445, Cl. 89-14.00C.

Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging Corporation. Carton packing station fixture. 4,398,381, Cl. 53-393.000.

Ultra-Temp Corporation: *See—*
Lueth, Roy C., 4,398,702, Cl. 266-208.000.

Umehara, Akira: *See—*
Kondo, Syunichi; Matsufuji, Akihiro; Umehara, Akira; Ukai, Toshinao; and Sato, Akira, 4,399,211, Cl. 430-269.000.

Umemura, Yoshifumi: *See—*
Suzuki, Hajime; Umemura, Yoshifumi; and Tanaka, Shigeru, 4,398,569, Cl. 139-88.000.

Underhill, Lloyd J.; and Helgeson, William D., to Medtronic, Inc. Method for lithium anode and electrochemical cell fabrication. 4,398,346, Cl. 29-623.500.

Undheim, Kjell: *See—*
Gacek, Mikkel; and Undheim, Kjell, 4,399,140, Cl. 424-251.000.

Unie van Kunstmestfabrieken, B.V.: *See—*
Hoogendonk, Johan W.; and Lucassen, Servatius J., 4,398,936, Cl. 71-36.000.

Union Carbide Corporation: *See—*
Anthony, John; and Kurtz, Stuart J., 4,399,173, Cl. 428-35.000.
Cheung, Harry, 4,399,120, Cl. 423-648.00A.
Clark, Milton B., 4,399,204, Cl. 429-197.000.
Doshi, Kishore J., 4,398,926, Cl. 55-16.000.
Fujitani, Shigeo; and Matsuda, Youichi, 4,399,094, Cl. 264-566.000.
Schreck, David J., 4,399,305, Cl. 562-607.000.
Wilson, Charles A., II, 4,399,148, Cl. 424-285.000.

Union Siderurgique du Nord et de l'Est de la France "USINOR": *See—*
Cordier, Jean; and Rollot, Pierre, 4,398,701, Cl. 266-193.000.

Unisearch Limited: *See—*
Vaughan, Richard; and Cole, Peter H., 4,399,441, Cl. 343-6.5SS.
Wallwork, Greig R., 4,398,951, Cl. 75-124.00E.

United Brands Company: *See—*
Hughes, Paul R.; and Campbell, John E., 4,399,428, Cl. 340-500.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Leigh, John W., 4,398,467, Cl. 102-491.000.

United States of America
Agriculture: *See—*
Walters, Gerald A.; and Goo, Donovan, 4,398,578, Cl. 141-238.000.
Air Force: *See—*
Fritts, David H.; and Leonard, John F., 4,399,005, Cl. 204-2.100.
Hope, Dana R., 4,398,430, Cl. 73-862.540.
Horner, Joseph L.; and Ludman, Jacques E., 4,398,792, Cl. 350-96.190.
Jacocks, James L.; and Henderson, Henry L., 4,398,415, Cl. 73-147.000.
Leger, James E.; O'Brien, Patrick J.; and Mihlbachler, Carl B., 4,398,686, Cl. 244-137.00R.
Mayer, Arnold H., 4,399,484, Cl. 361-382.000.
Task, Harry L.; Courtright, John F.; and Genco, Louis V., 4,398,685, Cl. 244-135.00A.
Army: *See—*
Balasubramanian, N., 4,398,787, Cl. 350-6.400.
Brown, Robert L., 4,398,340, Cl. 29-571.000.
DeSantis, Charles M.; and True, Robert M., 4,399,442, Cl. 343-100.0SA.
LaFever, Clifford E., 4,398,448, Cl. 89-185.000.
Pagano, Victor H.; and Seyfert, William J., 4,398,446, Cl. 89-36.00H.
Ruwe, Victor W.; Kerr, James A.; and Sandeau, Rene F., Jr., 4,399,488, Cl. 361-412.000.
National Aeronautics and Space Administration: *See—*
Clauss, Robert C.; and Quinn, Rex B., 4,399,415, Cl. 330-4.000.
Gross, Chris, 4,399,515, Cl. 364-571.000.
Huneidi, Farouk, 4,398,412, Cl. 73-32.00R.
Maestrello, Lucio, 4,398,667, Cl. 239-265.170.
Trinh, Eugene H.; Elleman, Daniel D.; and Wang, Taylor G., 4,398,925, Cl. 55-15.000.
Navy: *See—*
Burdette, George W.; and Schneider, Abraham I., 4,398,978, Cl. 149-109.600.
Cowen, Steven J., 4,399,564, Cl. 455-608.000.
Eynck, John J., 4,399,526, Cl. 367-149.000.
Forrester, Howard M., 4,399,418, Cl. 332-7.510.
Hafner, Kurt F., Jr., 4,399,322, Cl. 174-101.500.
Hsu, David S. Y.; and Manuccia, Thomas J., Jr., 4,399,011, Cl. 204-163.00R.
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,398,687, Cl. 244-207.000.
Stall, Richard A.; Wood, Colin E. C.; and Eastman, Lester F., 4,398,963, Cl. 148-1.500.
Ulrich, George W., 4,398,445, Cl. 89-14.00C.
Webster, Henry A., III, 4,398,977, Cl. 149-42.000.
Woolaver, Dennis A.; and Baitis, A. Erich, 4,398,486, Cl. 114-144.00R.

U.S. Philips Corporation: *See—*
Boeke, Wouter M., 4,399,374, Cl. 307-297.000.
Dietz, Wolfgang, 4,398,788, Cl. 350-550.000.
Franssen, Nico V., deceased; and de Haan, Friedrich J., administrator, 4,399,328, Cl. 179-1.0GA.
Lohstroh, Jan, 4,399,450, Cl. 357-59.000.
Sempel, Adrianus, 4,399,375, Cl. 307-297.000.
Smulders, Hendricus F. G.; and Bartman, Gerrit E., 4,398,935, Cl. 65-64.000.
Sprangers, Wilhelmus; and Dijkstra, Rinse, 4,399,090, Cl. 264-63.000.
Van Alphen, Willem M., 4,398,896, Cl. 445-5.000.
Watkinson, Stephen W., 4,399,560, Cl. 455-260.000.
Zalm, Peter C., 4,399,456, Cl. 358-92.000.

United States Steel Corporation: *See—*
Hamill, Paul E., Jr.; and Kachik, Robert H., 4,398,588, Cl. 164-53.000.

United Technologies Corporation: *See—*
Langston, Chandos E., Jr., 4,398,388, Cl. 60-241.000.
Oughstun, Kurt E., 4,399,543, Cl. 372-95.000.
Prewo, Karl M.; and Brennan, John J., 4,399,231, Cl. 501-32.000.
Richter, Mark A., 4,398,659, Cl. 228-124.000.

Universal Instruments Corporation: *See—*
Snyder, Michael D.; Dean, Weibley J.; Merithew, David L.; Ragard, Philip A.; and Matson, Crawford A., 4,398,658, Cl. 227-46.000.

Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See—*
Schimko, Reinhold, 4,398,401, Cl. 66-64.000.

University of Illinois Foundation: *See—*
Ganic, Ejup N., 4,398,392, Cl. 60-657.000.

University of Michigan, The Regents of the: *See—*
Gooding, Elwyn R., 4,398,306, Cl. 2-421.000.

University of Southern Mississippi, The: *See—*
van Aller, Robert T.; and Pessoney, George F., 4,398,937, Cl. 71-67.000.

University of Utah Research Foundation: *See—*
Miller, Jan D., 4,399,027, Cl. 209-164.000.

University Patents, Inc.: *See—*
Fotino, Mircea, 4,399,360, Cl. 250-311.000.
Freiser, Henry; and Martin, Charles R., 4,399,002, Cl. 204-1.00T.

Uno, Testuyuki: *See—*
Ishikawa, Hiroshi; Uno, Testuyuki; Kano, Masanobu; and Nakagawa, Kazuyuki, 4,399,134, Cl. 424-246.000.

Upadhyayula, Lakshminarashimha C., to RCA Corporation. Signal switching matrix. 4,399,439, Cl. 340-825.910.

Upeslacis, Janis: *See—*
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,399,126, Cl. 424-180.000.

Upjohn Company, The: *See—*
Schurr, Paul E.; and Day, Charles E., 4,399,146, Cl. 424-283.000.
Tilgner, Peter; Wingard, Robert D.; Leida, Shirley M.; and Erwin, Kenneth L., Jr., 4,399,105, Cl. 422-111.000.

Urabe, Kiichiro, to Hitachi, Ltd. Memory control unit in a display apparatus having a buffer memory. 4,399,435, Cl. 340-750.000.

USM Corporation: *See—*
Schubring, Gary L., 4,398,317, Cl. 16-82.000.

Usui, Katsutoshi: *See—*
Ona, Isao; Ozaki, Masaru; Usui, Katsutoshi; and Taki, Yoichiro, 4,399,247, Cl. 524-204.000.

Usui, Noboru: *See—*
Tanaka, Kanji; and Usui, Noboru, 4,399,325, Cl. 179-1.0GM.

V. E. Anderson Mfg. Company: *See—*
Anderson, Richard N., 4,398,372, Cl. 49-65.000.

Vacco Industries: *See—*
Kay, George; and Keskinen, Alan, 4,398,563, Cl. 138-42.000.

VALEO Societe Anonyme: *See—*
Beccaris, Carlo, 4,398,625, Cl. 192-106.200.

Vallourec, S. A.: *See—*
Duret, Jean; Soulier, Charles; and Trouillet, Georges, 4,398,756, Cl. 285-334.000.

van Aller, Robert T.; and Pessoney, George F., to University of Southern Mississippi, The. Selective algaecides for control of cyanochloronta. 4,398,937, Cl. 71-67.000.

Van Alphen, Willem M., to U.S. Philips Corporation. Method of deburring and cleaning electrode systems. 4,398,896, Cl. 445-5.000.

Vandecasteele, Jean-Paul: *See—*
Guibet, Jean-Claude; and Vandecasteele, Jean-Paul, 4,398,920, Cl. 44-56.000.

Vandell, Arthur E. Cutting pipe with a cutting torch. 4,399,197, Cl. 428-584.000.

Vandenbroucke, Roger A. J.: *See—*
Camboulives, Andre A. M. L.; Hallinger, Claude C.; and Vandenbroucke, Roger A. J., 4,398,864, Cl. 415-134.000.

Vander, Timen: *See—*
van Laar, Jacobus; Vander, Timen; Kroes, Johannes A.; and Broersen, Pieter G., 4,398,999, Cl. 202-267.00R.

van der Linde, Willem B., to Borden, Inc. Car waxes with improved water-beading durability. 4,398,953, Cl. 106-10.000.

Vanderveen, John W.; Hitzman, Donald O.; and Wegner, Eugene H., to Phillips Petroleum Company. Cellular product separation. 4,399,223, Cl. 435-261.000.

Van Dyk, Garritt C., Jr., to Keene Corporation. Sealing apparatus for radio frequency shielding enclosure. 4,399,317, Cl. 174-35.0GC.

van Laar, Jacobus; Vander, Timen; Kroes, Johannes A.; and Broersen, Pieter G., to Estel Hoogovens BV. Coke-oven battery having tie cooking members. 4,398,999, Cl. 202-267.00R.

Vanlerberghe, Guy; and Sebag, Henry, to L'Oreal. Cyclical tensio-active polyethers. 4,398,912, Cl. 8-405.000.

Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Certain polyoxy perfluorinated surface active oligomers. 4,399,077, Cl. 260-501.130.

Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Polyoxyethyleneated non-ionic surface-active agents with two lipophilic chains. 4,399,313, Cl. 568-622.000.

VanSice, William S.; Sweka, Jonathan L.; and Marshall, Keith G., to Marmon Group, Inc., The. Self-positioning and self-adjusting press guard. 4,398,435, Cl. 74-612.000.

van Weert, Cornelis J. M., to Machinefabriek Wegra B.V. Method and apparatus for moistening bundles of flexible material in particular bundles of tobacco leaves. 4,398,548, Cl. 131-304.000.

Varitrac AG: *See—*
Horowitz, Alexandre; and Willemsen, Henricus P., 4,398,847, Cl. 405-199.000.

Vass, Andras: *See—*
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Vaughan, Richard; and Cole, Peter H., to Unisearch Limited. Apparatus for remote temperature reading. 4,399,441, Cl. 343-6.5SS.

Vazquez, Gonzalo, to Ava International Corporation. Systems for landing wire line tools at selected levels within a well tubing string. 4,398,600, Cl. 166-206.000.

Velsicol Chemical Corporation: *See—*
Stach, Leonard J.; and Wu, Frank, 4,398,938, Cl. 71-88.000.

Venero, Agustin F.: *See—*
Asher, William J.; and Venero, Agustin F., 4,398,927, Cl. 55-34.000.

Vennmann, Friedhelm: *See—*
Harmsen, Lothar; Vennmann, Friedhelm; and Zieschang, Jurgen, 4,399,545, Cl. 373-94.000.

Vertesi, Ervin: *See—*
Domjan nee Pinter, Kornelia; Huszak, Gyorgy; Kolonics, Zoltan; Lendvai, Laszlo; Pelyva, Jeno; Sumegi, Endre; Tomordi, Elemer; Gyorfi, Bela; Szabo, Laszlo J.; Haas, Andras; Kovacs, Miklos; Kulcsar, Taszlo; Nadasy, Miklos; Nagy, Balint; Vass, Andras; and Vertesi, Ervin, 4,399,306, Cl. 564-214.000.

Vetter, Artur; and Medwed, Emmerich, to Multivac Sepp Haggenmuller KG. Packaging machine. 4,398,883, Cl. 432-225.000.

Viaggi, Ferdinando, to Officine Savio S.p.A. Gill boxes with rotating heads. 4,398,319, Cl. 19-129.00R.

Victor Company of Japan, Limited: *See—*
Yamamoto, Makoto; Miyaji, Naotaka; Ishigaki, Yukinobu; and Totsuka, Kaoru, 4,399,327, Cl. 179-1.0DM.

Vine, Irvin: *See—*
Balde, John W.; and Vine, Irvin, 4,398,887, Cl. 433-218.000.

Virginia Industries, Inc.: *See—*
Hitchner, John A.; and Klipp, Henry A., 4,398,329, Cl. 29-148.40R.

Vogel, John D.: *See—*
McCann, James D.; Williams, Theodore F.; and Vogel, John D., 4,399,446, Cl. 346-140.00R.

Vogel, Roger F.: *See—*
Stanulonis, John J.; Tabacek, Joseph A.; and Vogel, Roger F., 4,399,058, Cl. 252-438.000.

Vogl, Guenther: *See—*
Blum, Adolf; Kutschera, Peter; and Vogl, Guenther, 4,398,914, Cl. 8-456.000.

Vogt, Siegfried: *See—*
Scholl, Hans; and Vogt, Siegfried, 4,398,480, Cl. 112-121.120.

Vogt, Wilhelm: *See—*
Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenhain, Hermann, 4,399,300, Cl. 560-204.000.

Voirin, Robert, to Societe Nationale Elf Aquitaine. Process for the catalytic incineration of residual gases containing a low content of at least one sulfur compound selected from COS, CS_2 and the mercaptans and possibility at least one member of the group. 4,399,112, Cl. 423-230.000.

Volkova, Kira L.: *See—*
Rabinovich, Georgy L.; Lukina, Zoya P.; Volkova, Kira L.; and Mozhaiko, Viktor N., 4,399,051, Cl. 252-415.000.

Volkrodt, Wolfgang. Electrical machine. 4,399,382, Cl. 310-216.000.

Voll, Horst; and Braune, Gerhard, to Fag Kugelfischer Georg Schafer & Co. Carrier in a bearing assembly for enabling axial motion of a free end of a drive shaft. 4,398,774, Cl. 308-184.00R.

Volvo White Truck Corporation: *See—*
Moon, Charles L.; and Cieszko, Joseph T., 4,398,508, Cl. 123-41.490.

von Fischern, Bernhard: *See—*
Wagensonner, Eduard; Wagner, Karl; and von Fischern, Bernhard, 4,398,813, Cl. 354-23.00D.

von Holle, William G.: *See—*
McWilliams, Roy A.; and von Holle, William G., 4,398,801, Cl. 350-275.000.

Von Inten, Wolfgang: *See—*
Denzin, Horst; Von Inten, Wolfgang; and Pach, Horst, 4,398,458, Cl. 101-91.000.

Von Ruden, Dennis, to Redro, Inc. Connecting apparatus for a powerplant. 4,398,684, Cl. 244-54.000.

Vora, Madhukar B.: *See—*
Tickle, Andrew C.; and Vora, Madhukar B., 4,398,338, Cl. 29-571.000.

Vorne Industries, Inc.: *See—*
Schaeffer, Daniel, 4,399,354, Cl. 377-26.000.

Vorwerk & Co. Interholding GmbH: *See—*
Krumm, Heinz-Gerhard; and Neugart, Horst, 4,399,378, Cl. 310-56.000.

Vossen, John L., Jr.: *See—*
Zelez, Joseph; and Vossen, John L., Jr., 4,399,194, Cl. 428-457.000.

Vredenburg, Edric W., Sr. Packer-filler machine. 4,398,576, Cl. 141-68.000.

W & A Bates Limited: *See—*
Holroyd, Eric; and Perkins, David J. B., 4,399,187, Cl. 428-295.000.

W. R. Grace & Co.: *See—*
Rosenberg, Arnold M.; Gaidis, James M.; and Troffkin, Howard J., 4,398,959, Cl. 106-90.000.

W. Schlafhorst & Co.: *See—*
Kupper, Wilhelm, 4,398,681, Cl. 242-150.00R.

Wacker-Chemie GmbH: *See—*
Bosch, Erhard; Craubner, Ingo; Dorsch, Norman; Schiller, August; and Sommer, Oswin, 4,399,267, Cl. 528-30.000.
Preiner, Gerhard; Muller, Johann; and Wegehaupt, Karl-Heinrich, 4,399,193, Cl. 428-447.000.

Wackerle, Peter: *See—*
Hahn, Michael; Wackerle, Peter; Eschenfelder, Peter; and Schulz, Ralf-Thilo, 4,398,693, Cl. 249-155.000.

Wada, Masato: *See—*
Tanimoto, Masafumi; Ieda, Nobuaki; and Wada, Masato, 4,399,372, Cl. 307-279.000.

Wade, Robert C., to Thiokol Corporation. Alkali metal borohydride concentrate. 4,399,238, Cl. 521-82.000.

Wagener Schwelm GmbH & Co.: *See—*
Thies, Peter, 4,398,991, Cl. 156-583.100.

Wagensonner, Eduard; Wagner, Karl; and von Fischern, Bernhard, to Agfa-Gevaert AG. Photographic camera. 4,398,813, Cl. 354-23.00D.

Wagner, Karl: *See—*
Wagensonner, Eduard; Wagner, Karl; and von Fischern, Bernhard, 4,398,813, Cl. 354-23.00D.

Wahlmann, Ernst; and Schottker, Willi, to P.A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen. Shoulder level link point for vehicle safety belt. 4,398,751, Cl. 280-808.000.

Wakahara, Akira: *See—*
Suzuki, Tomosaburo; and Wakahara, Akira, 4,398,983, Cl. 156-185.000.

Wakai, Youichi, to Kabushiki Kaisha Suwa Seikosha. Electronic watch with demonstration display mode. 4,398,834, Cl. 368-223.000.

Wakatsuka, Hirohisa: *See—*
Hayashi, Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Wakatsuka, Hirohisa; and Ito, Hiroyuki, 4,399,147, Cl. 424-285.000.

Wakatsuki, Misuzu: *See—*
Yoshinaka, Shigeo; Toki, Tsukasa; Wakatsuki, Misuzu; and Uchiyama, Seiji, 4,399,311, Cl. 568-437.000.

Wake, Kiyoyasu, to Miwa Rokku Kogyo Kabushiki Kaisha. Key disengagement preventive device for magnetic tumbler cylinder locks. 4,398,404, Cl. 70-276.000.

Walker, Connie W.: *See—*
Ulrich, Lawrence W.; and Walker, Connie W., 4,398,381, Cl. 53-393.000.

Walker, John. Plectrum. 4,398,444, Cl. 84-322.000.

Wallace, Richard B., to Oakland Corporation, The. Friction lock for threads. 4,399,166, Cl. 427-195.000.

Waller, Jack D.: *See—*
Sandlin, Felix M.; De Villez, Richard L.; and Waller, Jack D., 4,398,543, Cl. 128-760.000.

Walls, John E.: *See—*
Gillich, Thomas N.; Walls, John E.; Wanat, Stanley F.; and Rozell, William J., 4,399,021, Cl. 204-38.00A.

Wallwork, Greig R., to Unisearch Limited. Fermalloy(Fe-Mn-Al stainless steel). 4,398,951, Cl. 75-124.00E.

Walter, Juris, to Swiss Aluminium Ltd. Process for manufacturing foamed plastic sheets. 4,399,086, Cl. 264-45.500.

Walters, Gerald A.; and Goo, Donovan, to United States of America, Agriculture. Distributor for gravel and seeds. 4,398,578, Cl. 141-238.000.

Wanat, Stanley F.: *See—*
Gillich, Thomas N.; Walls, John E.; Wanat, Stanley F.; and Rozell, William J., 4,399,021, Cl. 204-38.00A.

Wang Laboratories, Inc.: *See—*
Nelson, Alfred M.; Rasekhi, Houshang; and Sudano, John J., 4,399,422, Cl. 335-284.000.

Wang, Taylor G.: *See—*
Trinh, Eugene H.; Elleman, Daniel D.; and Wang, Taylor G., 4,398,925, Cl. 55-15.000.

Ward, Phillip B., Jr.: *See—*
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Warner Lambert Company: *See—*
Fisher, James R.; and Kulier, Charles P., 4,399,283, Cl. 546-106.000.

Warnock, Richard B.; and Brugger, Leonard J., to Fernseh Inc. Digital comb filtering for PAL television signals. 4,399,454, Cl. 358-16.000.

Watanabe, Katsunori: *See—*
Katagiri, Kazuharu; Watanabe, Katsunori; Ishikawa, Shozo; and Kitahara, Makoto, 4,399,206, Cl. 430-58.000.

Watanabe, Yoshikazu; and Tanaka, Motoaki, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive photographic material. 4,399,213, Cl. 430-523.000.

Water Services of America, Inc.: *See—*
Baron, Walter J.; and Cleaver, Laird C., 4,398,592, Cl. 165-95.000.

Waters, Edwin R., to Bendix Corporation, The. EMI Shielding enclosure for a cable connector. 4,399,318, Cl. 174-35.00C.

Watkinson, Stephen W., to U.S. Philips Corporation. Double phase lock loop arrangement. 4,399,560, Cl. 455-260.000.

Watts, Elvert S.: *See—*
Novotny, Lawrence G.; and Watts, Elvert S., 4,398,780, Cl. 339-49.00R.

Watts, Vern L.: *See—*
Obermarck, Ronald L.; Strickland, Jimmy P.; and Watts, Vern L., 4,399,504, Cl. 364-200.000.

Weaver, James C., to Massachusetts Institute of Technology. Process for isolating microbiologically active material. 4,399,219, Cl. 435-34.000.

Weber, Georg: *See—*
Pohl, Ludwig; Eidenschink, Rudolf; del Pino, Fernando; and Weber, Georg, 4,398,803, Cl. 350-334.000.

Webster, Henry A., III, to United States of America, Navy. Simultaneous red smoke and bright flame composition containing ammonium iodate. 4,398,977, Cl. 149-42.000.

Wedertz, Larry D.; and Ross, Oakley G., to General Dynamics, Pomona Division. Eccentric fiber optic adjustable holder. 4,398,797, Cl. 350-96.210.

Wedig, John H.: *See—*
Davidson, Jeffrey; Babish, John G.; and Wedig, John H., 4,399,130, Cl. 424-245.000.

Wegehaupt, Karl-Heinrich: *See—*
Preiner, Gerhard; Muller, Johann; and Wegehaupt, Karl-Heinrich, 4,399,193, Cl. 428-447.000.

Wegner, Eugene H.: *See—*
Vanderveen, John W.; Hitzman, Donald O.; and Wegner, Eugene H., 4,399,223, Cl. 435-261.000.

Weidmann, Wilfried: *See—*
Rucker, Gerhard; Weidmann, Wilfried; and Reisenweber, Karl-Ullrich, 4,398,730, Cl. 277-96.100.

Weinert, Friedrich. Oceanic seaplow system. 4,398,362, Cl. 37-61.000.

Weinstein, David, to Weinstein, David. Package for ice cream cones. 4,398,633, Cl. 206-499.000.

Welzhofer, Klaus, to Siemens Aktiengesellschaft. Test facility. 4,399,405, Cl. 324-73.0AT.

Werner Kessl Giessereibedarf GmbH: *See—*
Doliwa, Heinz-Ulrich, 4,398,946, Cl. 75-30.000.

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Wernicki, John J. Gun lock. 4,398,366, Cl. 42-1.0LP.

Werthmann, Neil J., to Polyweave Products, Inc. Method of ventilating underground mines and improved brattice cloth construction useful therein. 4,398,451, Cl. 98-50.000.

Wesner, Charles R., to Sperry Corporation. Compass data converter. 4,398,353, Cl. 33-363.00R.

West Company, The: *See—*
Allen, Roland M.; and Kalocai, Andrew J., 4,398,989, Cl. 156-500.000.

West, James K.: *See—*
Perkins, Walton A., III; Rossol, Lothar; Dewar, Robert; and West, James K., 4,399,554, Cl. 382-8.000.

West Point Pepperell, Inc.: *See—*
Bryant, Clifford A.; Bearden, Gary M.; and Pacifici, Joseph A., 4,398,665, Cl. 239-193.000.

Westelaken, Christianus M. T. Multi-stage dryer for particulate material. 4,398,356, Cl. 34-65.000.

Westergren, Bo K.: *See—*
Kullander, Gregor H.; Chatfield, Christopher G.; Mikus, Marian; and Westergren, Bo K., 4,399,168, Cl. 427-255.700.

Western Electric Company, Inc.: *See—*
Chisholm, William M., 4,398,628, Cl. 198-339.000.
Marschner, Jamie J.; and Maxon, Rodney R., 4,399,532, Cl. 370-62.000.

Westinghouse Electric Corp.: *See—*
Morris, Peter J., 4,399,095, Cl. 376-216.000.
Shum, Lanson Y., 4,398,863, Cl. 414-733.000.

Wetzel, Joseph A.: *See—*
Evans, Charles W.; Flusche, Frederick O.; Messina, Benedicto U.; Richardson, Ethel L.; Robinson, James R.; and Wetzel, Joseph A., 4,399,506, Cl. 364-200.000.

Wey, Jong-Shinn, to Eastman Kodak Company. Double-jet precipitation processes and products thereof. 4,399,215, Cl. 430-567.000.

Weyerhaeuser Company: *See—*
Mangum, Robert J., 4,398,902, Cl. 493-102.000.

Wharton, James H., to RCA Corporation. Stereophonic bilingual signal processor. 4,399,329, Cl. 179-1.0GB.

Whatmough, Nigel S.: *See—*
Robinson, Frank; and Whatmough, Nigel S., 4,398,402, Cl. 66-176.000.

Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert. Acoustical heat pumping engine. 4,398,398, Cl. 62-467.00R.

Whidden, Glenn H. Device for locating audio surveillance apparatus. 4,399,556, Cl. 455-67.000.

Whirlpool Corporation: *See—*
Kirby, David B.; and Heybey, Otfried W. G., 4,399,093, Cl. 264-328.200.

White, Alan D.: *See—*
Feldman, Martin; White, Alan D.; and White, Donald L., 4,398,824, Cl. 356-401.000.

White, Dennis A., to Hartford Steam Boiler Inspection and Insurance Company. Ultrasonic thickness measuring apparatus and method. 4,398,421, Cl. 73-597.000.

White, Donald L.: *See—*
Feldman, Martin; White, Alan D.; and White, Donald L., 4,398,824, Cl. 356-401.000.

White, Jonathan C., to Bell Telephone Laboratories, Incorporated. Auto-ionization pumped anti-Stokes Raman laser. 4,399,539, Cl. 372-3.000.

Whysall, David H.: *See—*
Pitt, Gillies D.; Greene, Peter D.; Thrush, Edward J.; and Whysall, David H., 4,398,342, Cl. 29-580.000.

Wico Corporation: *See—*
Wiczer, Max, 4,398,718, Cl. 273-129.00V.

Wiczer, Max, to Wico Corporation. Illuminated flipper assembly. 4,398,718, Cl. 273-129.00V.

Wiebe, Kenneth R. Fishing rod combination having improved sensitivity. 4,398,369, Cl. 43-18.100.

Wigler, Michael H.: *See—*
Axel, Richard; Wigler, Michael H.; and Silverstein, Saul J., 4,399,216, Cl. 435-6.000.

Wilcox, Doyle E.: *See—*
Shutt, Sidney G.; Dorsman, Adrian K.; and Wilcox, Doyle E., 4,398,418, Cl. 73-517.00B.

Wilke, Rudolf H. Wall bracket. 4,398,691, Cl. 248-235.000.

Wilkerson, Herman W., to Carrier Corporation. Flue pipe connector for a vent cap. 4,398,453, Cl. 98-122.000.

Willemsen, Henricus P.: *See—*
Horowitz, Alexandre; and Willemsen, Henricus P., 4,398,847, Cl. 405-199.000.

Williams, Alvin R.; and Shaffer, Douglas E., to John D. Brush & Co., Inc. Wall safe. 4,398,470, Cl. 109-52.000.

Williams, Arthur L., to Lockheed Corporation. Leading edge flap for an airfoil. 4,398,688, Cl. 244-207.000.

Williams Gold Refining Company Incorporated: *See—*
Agarwal, Dwarika P.; and Ingersoll, Clyde E., 4,399,096, Cl. 420-463.000.

Williams, Theodore F.: *See—*
McCann, James D.; Williams, Theodore F.; and Vogel, John D., 4,399,446, Cl. 346-140.00R.

Williamson, Calvin C., to Kaiser Steel Corporation. Plate latch and guide system. 4,398,629, Cl. 198-479.000.

Williamson, Geronimo C. Pipe plugging apparatus. 4,398,565, Cl. 138-93.000.

Willis, John H.; and Heath, Trevor C., to TBA Industrial Products Ltd.; and Bishop and Associates, Inc. Manufacture of staple glass fibers. 4,398,934, Cl. 65-2.000.

Wilson, Charles A., II, to Union Carbide Corporation. Hydroxyarylalkyleneaminoaryl carbamates and derivatives thereof useful as insecticidal compositions. 4,399,148, Cl. 424-285.000.

Wilson, David A., to Dow Chemical Company, The. Stable salt-free partially chelated metal compositions and method of preparation. 4,399,070, Cl. 260-429.900.

Wilson, Donald E.: *See—*
Hartel, Edward O.; Libertini, Zoltan L.; Manente, Joseph C., Jr.; and Wilson, Donald E., 4,398,866, Cl. 415-180.000.

Wilson, Gary L.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,398,483, Cl. 114-56.000.

Wilson, J. A. Sam, to Cyclotechnical Medical Industries, Inc. Pain-blocking bandage. 4,398,545, Cl. 128-798.000.

Wilson, Wayne D.; and Joyce, James J. Volleyball net touch detecting and indicating system. 4,398,724, Cl. 273-411.000.

Wingard, Robert D.: *See—*
Tilgner, Peter; Wingard, Robert D.; Leida, Shirley M.; and Erwin, Kenneth L., Jr., 4,399,105, Cl. 422-111.000.

Winter, John M.: *See—*
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Wise, Daniel J., to Ex-Cell-O Corporation. Method of forming paperboard blanks for liquid container with straw opening means. 4,398,900, Cl. 493-62.000.

Wisebaker, Robert E.; and Kline, Gaylen O., to National Machinery Company, The. Forging machine transfer. 4,398,408, Cl. 72-422.000.

Witerski, Peter C.; and Pierson, Charles W., to Eastman Kodak Company. Spliced web and method for forming a splice. 4,398,982, Cl. 156-157.000.

Withers, Michael S., to Du Pont de Nemours, E. I., and Company. Web-supported membrane. 4,399,183, Cl. 428-247.000.

Witiak, David: *See—*
Smith, Frederick R.; Toy, Walter W.; and Witiak, David, 4,399,255, Cl. 525-54.210.

Wittlinger, Harold A., to RCA Corporation. Voltage reference circuit with feedback circuit. 4,399,398, Cl. 323-226.000.

Wixon, Harold E.: *See—*
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,399,048, Cl. 252-91.000.

Woerz, Hans: *See—*
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Wolfston, James H.: *See—*
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Wolowodiuk, Catherine: *See—*
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Woo, James T. K.: *See—*
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Wood, Colin E. C.: *See—*
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Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Vee type planing hull with AFT tapered wedges. 4,398,483, Cl. 114-56.000.

Wood Manufacturing Company, Incorporated: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,398,483, Cl. 114-56.000.

Wood, Thomas D.; and Reiss, Garry K., to J. B. Foote Foundry Co., The. Variable speed pulley. 4,398,899, Cl. 474-37.000.

Woodcock, Robert R.: *See—*
Evans, Brian L.; and Woodcock, Robert R., 4,398,735, Cl. 280-11.280.

Woodward, Oakley M., to RCA Corporation. Non-contacting RF shielding device. 4,399,316, Cl. 174-35.0GC.

Woolaver, Dennis A.; and Baitis, A. Erich, to United States of America, Navy. Mechanical actuation device for ship roll stabilization. 4,398,486, Cl. 114-144.00R.

Wooten, Gary D.: *See—*
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Workman, Samuel E.: *See—*
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Wraga, Joseph B.: *See—*
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Wrapade Machine Company, Inc.: *See—*
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Wright, Brian J.: *See—*
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Wright, George M.: *See—*
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Wright, Kenneth: *See—*
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Wright, Kurt O.; Brehm, Timothy L.; Berger, Duaine E.; and Matsuoka, Paul S., to Ampex Corporation. Air baffle assembly for electronic circuit mounting frame. 4,399,485, Cl. 361-383.000.

Wright, Richard F.: *See—*
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Wruk, Philip J.: *See—*
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Wu, Frank: *See—*
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Xerox Corporation: *See—*
George, Clifford L., 4,398,712, Cl. 271-293.000.
Jeromin, Lothar S.; and Kahler, Wayne L., 4,398,818, Cl. 355-10.000.
Kopko, John J., 4,398,496, Cl. 118-658.000.
Schron, Steven M., 4,398,819, Cl. 355-14.00R.
Thayer, Bruce E., 4,398,820, Cl. 355-15.000.

Xienta, Inc.: *See—*
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Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, to UBE Industries, Ltd. Continuous inorganic fibers and process for production thereof. 4,399,232, Cl. 501-38.000.

Yamada, Hirosuke: *See—*
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Yamada, Hisashi: *See—*
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Yamada, Takao: *See—*
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Yamaguchi, Yoshihiro: *See—*
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Yamaguti, Yuji; and Miyata, Hideo, to Nichifu Terminal Industries Co., Ltd. Continual crimper. 4,398,337, Cl. 29-564.600.

Yamamitsu, Chojuro: *See—*
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Yamamoto, Hachizou: *See—*
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Yamamoto, Hiroshi, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Method for quantitatively determining the degree of agglutination of particles. 4,398,894, Cl. 436-517.000.

Yamamoto, Katsuhiko; Yamamitsu, Chojuro; Sekimoto, Kunio; and Kurashina, Kozo, to Matsushita Electric Industrial Company, Limited. Phase difference compensation between separately recorded luminance and chrominance signals. 4,399,472, Cl. 358-320.000.

Yamamoto, Makoto; Miyaji, Naotaka; Ishigaki, Yukinobu; and Totsuka, Kaoru, to Victor Company of Japan, Limited. Variable directional microphone system. 4,399,327, Cl. 179-1.0DM.

Yamamoto, Yasuhiro: *See—*
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,399,089, Cl. 264-57.000.

Yamamoto, Yuji: *See—*
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Yamana, Toshifumi, to Rinnai Kabushiki Kaisha. Combustion safety apparatus. 4,398,882, Cl. 431-76.000.

Yamashita, Nobuo: *See*—
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Yamashita, Yoshito: *See*—
Endo, Yoshihiro; Yamashita, Yoshito; Kishishita, Hiroshi; and Uede, Hisashi, 4,399,015, Cl. 204-192.00P.
Yamato, Noboru; and Satake, Tosimi, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 4,399,188, Cl. 428-320.400.
Yamato Scale Company, Ltd.: *See*—
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Yamazaki, Sakuzo, to Sankin Engineering Company Limited. Pledget loading apparatus. 4,398,327, Cl. 29-33.00R.
Yamazaki, Shunpei. Method of making semi-amorphous semiconductor device. 4,398,343, Cl. 29-585.000.
Yano, Kohzo: *See*—
Hamada, Hiroshi; Yano, Kohzo; Koyanagi, Katubumi; Take, Hiroshi; and Inami, Yasuhiko, 4,399,436, Cl. 340-812.000.
Yasufuku, Yoshitaka; Takeuchi, Yoshio; and Kimura, Yoshiaki, to Konishiroku Photo Industry Co., Ltd. Ink composition and method for ink jet recording. 4,399,443, Cl. 346-1.100.
Yasuoka, Yoshio, to Sanyo Electric Co., Ltd. Microwave heating apparatus. 4,399,341, Cl. 219-10.55R.
Yessler, Ralph A., II, to Motter Printing Press Co. Non-repeat doctor blade drive. 4,398,463, Cl. 101-169.000.
Yiannoulos, Aristides A.: *See*—
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Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
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Yokoi, Gunpei, to Nintendo Co., Ltd. Liquid crystal display unit. 4,398,804, Cl. 350-337.000.
Yokomichi, Isao; Haga, Takahiro; Komyoji, Terumasa; Nakajima, Toshio; and Matsuo, Norifusa, to Ishihara Sangyo Kaisha, Ltd. Phenoxybutyltriazole compound, agricultural and horticultural fungicidal composition containing the same, and process for producing the same. 4,399,143, Cl. 424-263.000.
Yong, Raymond N., to Suncor, Inc. Method for dewatering the sludge layer of an industrial process tailings pond. 4,399,038, Cl. 210-728.000.
Yong, Raymond N., to Suncor, Inc. Treatment of tailings pond sludge. 4,399,039, Cl. 210-728.000.
Yoshida, Eizo: *See*—
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Yoshida, Zenichi; Kato, Susumu; Fujiki, Takuya; and Amemiya, Yasuhiro, to Asahi Chemical Company, Limited. Process for producing chlorinated phenoxytoluene derivatives. 4,399,075, Cl. 260-465.00F.
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, to Asahi-Dow Limited. Cold drawn high-orientation multilayered film and process for manufacture of said film. 4,399,181, Cl. 428-213.000.
Yoshinaka, Shigeo; Toki, Tsukasa; Wakatsuki, Misuzu; and Uchiyama, Seiji, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic aldehydes. 4,399,311, Cl. 568-437.000.
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Young, Steven J.; Semmel, Gary K.; and Munich, Terry L., to Federal Cartridge Corporation. Sealed lay-in wireway. 4,398,564, Cl. 138-92.000.
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Kawashima, Masayoshi; and Yuasa, Akio, 4,398,875, Cl. 425-127.000.
Yuto, Kazuaki; Oniki, Toru; Ikeda, Nobumasa; and Miyake, Itsuo, to Bridgestone Tire Company Limited. Pneumatic tire. 4,398,582, Cl. 152-209.00R.
Zagnoni, Graziano: *See*—
Cannata, Vincenzo; and Zagnoni, Graziano, 4,399,284, Cl. 546-134.000.
Zakaria, Moneeb, to Akzona Incorporated. Polyethoxylated compounds as coal-water slurry surfactants. 4,398,919, Cl. 44-51.000.
Zalm, Peter C., to U.S. Philips Corporation. Three-dimensional television picture display system and picture pick-up device and picture display device suitable therefor. 4,399,456, Cl. 358-92.000.
Zanzucchi, Peter J.; and Frenchu, William R., to RCA Corporation. Device for multisample infrared analysis of materials in microgram quantity. 4,399,361, Cl. 250-343.000.
Zechnall, Martin: *See*—
Schulz, Alfred; and Zechnall, Martin, 4,398,520, Cl. 123-481.000.
Zelez, Joseph; and Vossen, John L., Jr., to RCA Corporation. Transparent conductive film. 4,399,194, Cl. 428-457.000.
Zelli, Sante. Laterally compensating radial trolleys. 4,398,469, Cl. 105-170.000.
Zemelman, Valery B.: *See*—
Hinman, David C.; Zemelman, Valery B.; and Ramakka, William R., 4,398,395, Cl. 62-1.000.
Kleiner, Fredric; Ramakka, William R.; and Zemelman, Valery B., 4,398,394, Cl. 62-1.000.
Zemke, Edward H.: *See*—
Guenther, Kenneth L.; and Zemke, Edward H., 4,398,459, Cl. 101-93.010.
Zenith Radio Corporation: *See*—
Dobrovolny, Pierre, 4,399,419, Cl. 333-12.000.
Srivastava, Gopal K., 4,399,549, Cl. 377-108.000.
Ziegenhorn, Joachim: *See*—
Gauhl, Helmgard; Seidel, Hans; Lang, Gunter; Roder, Albert; and Ziegenhorn, Joachim, 4,399,218, Cl. 435-25.000.
Zieschang, Jurgen: *See*—
Harmsen, Lothar; Vennmann, Friedhelm; and Zieschang, Jurgen, 4,399,545, Cl. 373-94.000.
Ziff, Stephen J.; Sieron, Richard L.; and Shine, William P., to Dual-Lite, Inc. Modular wiring systems. 4,399,371, Cl. 307-147.000.
Zink, Arden K.: *See*—
Parks, Ronald K.; and Zink, Arden K., 4,398,768, Cl. 298-2.000.
Zinn, Michael F., to Bio-Energy Systems, Inc. Thermally insulated composite flexible hose. 4,399,319, Cl. 174-47.000.
Zook, James L.: *See*—
Hlavinka, Dennis J.; Johnson, Steven H.; and Zook, James L., 4,399,030, Cl. 210-91.000.
Zsolnay, Andrew; Perkins, Kelly M.; and Blad, Leiv H., to Lockheed Corporation. Automatic process control system and method for curing polymeric materials. 4,399,100, Cl. 422-62.000.
Zweifel, Hans; Berger, Joseph; and Bosshard, Hans, to Ciba-Geigy Corporation. Photocrosslinkable polymers with side groups derived from indenone and the preparation and use of these polymers. 4,399,259, Cl. 525-289.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzona Incorporated: *See*—
Schwartzkopff, Udo; and Fischer, Horst, Re. 31,345, Cl. 119-28.000.

Becker, Kunibert; Heyer, Willy; Plevak, Lubomir; and Dodt, Jurgen, to Gewerschaft Eisenhutte Westfalia. Advance mechanism for a mine roof support assembly. Re. 31,346, Cl. 405-300.000.

Bell Telephone Laboratories, Incorporated: *See*—
Falconer, David D., Re. 31,351, Cl. 375-15.000.

Bray, James A.: *See*—
Smith, John R.; and Bray, James A., Re. 31,349, Cl. 428-623.000.

Chamran, Morteza M.; and Dimovski, Milan R., to Perkin-Elmer Corporation, The. Photodetector arrangements and circuits. Re. 31,350, Cl. 250-211.00R.

Dimovski, Milan R.: *See*—
Chamran, Morteza M.; and Dimovski, Milan R., Re. 31,350, Cl. 250-211.00R.

Dodt, Jurgen: *See*—
Becker, Kunibert; Heyer, Willy; Plevak, Lubomir; and Dodt, Jurgen, Re. 31,346, Cl. 405-300.000.

Eibe, Werner W., to White Consolidated Industries, Inc. Semi-continuous hot rolling of metal strip and plates. Re. 31,344, Cl. 72-227.000.

Falconer, David D., to Bell Telephone Laboratories, Incorporated. Feedback nonlinear equalization of modulated data signals. Re. 31,351, Cl. 375-15.000.

Fischer, Horst: *See*—
Schwartzkopff, Udo; and Fischer, Horst, Re. 31,345, Cl. 119-28.000.

Gewerschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; Heyer, Willy; Plevak, Lubomir; and Dodt, Jurgen, Re. 31,346, Cl. 405-300.000.

Hallberg, Rolf O.: *See*—
Reijonen, Veli E.; Martinell, Rudolf H.; and Hallberg, Rolf O., Re. 31,347, Cl. 48-197.00R.

Heyer, Willy: *See*—
Becker, Kunibert; Heyer, Willy; Plevak, Lubomir; and Dodt, Jurgen, Re. 31,346, Cl. 405-300.000.

Klanica, Andrew J.: *See*—
Wojtowicz, John A.; and Klanica, Andrew J., Re. 31,348, Cl. 423-473.000.

Martinell, Rudolf H.: *See*—
Reijonen, Veli E.; Martinell, Rudolf H.; and Hallberg, Rolf O., Re. 31,347, Cl. 48-197.00R.

National Steel Corporation: *See*—
Smith, John R.; and Bray, James A., Re. 31,349, Cl. 428-623.000.

Olin Corporation: *See*—
Wojtowicz, John A.; and Klanica, Andrew J., Re. 31,348, Cl. 423-473.000.

Perkin-Elmer Corporation, The: *See*—
Chamran, Morteza M.; and Dimovski, Milan R., Re. 31,350, Cl. 250-211.00R.

Plevak, Lubomir: *See*—
Becker, Kunibert; Heyer, Willy; Plevak, Lubomir; and Dodt, Jurgen, Re. 31,346, Cl. 405-300.000.

Reijonen, Veli E.; Martinell, Rudolf H.; and Hallberg, Rolf O., to VYR-Metoder, AB. Procedure for separating and recovering marsh gas. Re. 31,347, Cl. 48-197.00R.

Schwartzkopff, Udo; and Fischer, Horst, to Akzona Incorporated. Floor covering sheet for t²ables. Re. 31,345, Cl. 119-28.000.

Smith, John R.; and Bray, James A., to National Steel Corporation. Lubricated metallic container stocks and method of preparing the same and applying organic coating thereto. Re. 31,349, Cl. 428-623.000.

VYR-Metoder, AB: *See*—
Reijonen, Veli E.; Martinell, Rudolf H.; and Hallberg, Rolf O., Re. 31,347, Cl. 48-197.00R.

White Consolidated Industries, Inc.: *See*—
Eibe, Werner W., Re. 31,344, Cl. 72-227.000.

Wojtowicz, John A.; and Klanica, Andrew J., to Olin Corporation. Hypochlorous acid process using sweep reactor. Re. 31,348, Cl. 423-473.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Alleman, Mark M.; and Marx, Rodger L., to Caterpillar Tractor Co. Anti-polluting waste collector for a burn table. B1 3,743,260, 8-16-83, Cl. 266-49.000.

Bower, Jr. Arnold B., to Hughes Tool Co. Cutter bit. B1 3,476,438, 8-16-83, Cl. 299-86.000.

Caterpillar Tractor Co.: *See*—
Alleman, Mark M.; and Marx, Rodger L., B1 3,743,260, Cl. 266-49.000.

Dirksing, Robert S., to Procter & Gamble Company, The. Passive dosing dispenser employing trapped air bubble to provide air-lock. B1 4,208,747, 8-16-83, Cl. 4-228.000.

Electric Power Research Institute, Inc.: *See*—
Putt, Ronald A.; and Montgomery, Mark J., B1 4,162,351, Cl. 429-15.000.

Hughes Tool Co.: *See*—
Bower, Jr. Arnold B. B1 3,476,438, Cl. 299-86.000.

Marx, Rodger L.: *See*—
Alleman, Mark M.; and Marx, Rodger L., B1 3,743,260, Cl. 266-49.000.

Montgomery, Mark J.: *See*—
Putt, Ronald A.; and Montgomery, Mark J., B1 4,162,351, Cl. 429-15.000.

Procter & Gamble Company, The: *See*—
Dirksing, Robert S., B1 4,208,747, Cl. 4-228.000.

Putt, Ronald A.; and Montgomery, Mark J., to Electric Power Research Institute, Inc. Metal-halogen cell operation with storage of halogen via organic complexation external to the electrochemical cell. B1 4,162,351, 8-16-83, Cl. 429-15.000.

Strange, Roger W. Means and method of reclaiming crankcase oil. B1 4,332,282, 8-16-83, Cl. 141-1.000.

LIST OF DESIGN PATENTEES

AB Wicanders Korkfabriker: *See*—
Berglund, Jan, 270,140, Cl. D9-438.000.
Aldridge, R. Warren, Jr. Brake lathe. 270,160, 8-16-83, Cl. D15-130.000.
Amerace Corporation: *See*—
Flanagan, Robert M., 270,143, Cl. D10-113.000.
Antonacci, Frank; and Carluccio, Ronald. Blow dryer. 270,192, 8-16-83, Cl. D28-13.000.
Arrow Trading Co., Inc.: *See*—
Shimizu, Y., 270,155, Cl. D14-53.000.
Shimizu, Y., 270,156, Cl. D14-56.000.
Aulbert, Harold V.; and Horton, Charles M. Dresser or the like. 270,124, 8-16-83, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M. Dresser or the like. 270,125, 8-16-83, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M. Dresser or the like. 270,126, 8-16-83, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M. Dresser or the like. 270,127, 8-16-83, Cl. D6-164.000.
Ballereaud, Pierre, to Produits de Beaute Lancaster. Container closure. 270,139, 8-16-83, Cl. D9-435.000.
Barbieri, Raul; and Marianelli, Giorgio. Ashtray. 270,191, 8-16-83, Cl. D27-29.000.
Battaglia, Anthony. Brush. 270,113, 8-16-83, Cl. D4-35.000.
Bechtel, Daniel L. Scope mount for a pistol. 270,173, 8-16-83, Cl. D22-7.000.
Berglund, Jan, to AB Wicanders Korkfabriker. Bottle cap. 270,140, 8-16-83, Cl. D9-438.000.
Berkan-Heck Company: *See*—
Heck, Michael E., 270,178, Cl. D23-7.000.
Bingaman, Roberta N. Fire extinguisher cover. 270,123, 8-16-83, Cl. D6-152.000.
Bird, Richard M.: *See*—
Stoute, Nevilie; and Pennise, Robert J., 270,134, Cl. D9-305.000.
Bluemel, Peter E., to Jack Light Industrial Company Limited. Safety jacket. 270,109, 8-16-83, Cl. D2-27.000.
Boldt, Melvin H.; Chuboff, David P.; Franek, Wayne J.; and Johnson, Marilyn M., to Zenith Radio Corporation. Telephone handset. 270,157, 8-16-83, Cl. D14-63.000.
Brown, John F. Wall rack. 270,121, 8-16-83, Cl. D6-114.000.
Bruce, Marilyn M. Jewelry pendant. 270,144, 8-16-83, Cl. D11-79.000.
Bruce, Marilyn M. Pendant. 270,145, 8-16-83, Cl. D11-82.000.
Burns, Dennis L., to Pro-Tec, Inc. Eyeglasses. 270,165, 8-16-83, Cl. D16-117.000.
Byrne & Davidson Doors (NSW) Pty. Limited: *See*—
Jones, Richard E., 270,186, Cl. D25-74.000.
Whitehouse, Martin H.; and Combs, Robert L., 270,187, Cl. D25-74.000.
Whitehouse, Martin H., 270,188, Cl. D25-74.000.
C. Bruno & Son, Inc.: *See*—
Hoey, Fred A., 270,167, Cl. D17-22.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederick W., 270,142, Cl. D10-77.000.
Candiliotis, Gerassimos C., to Uniroyal, Inc. Pneumatic tire tread and buttress. 270,149, 8-16-83, Cl. D12-146.000.
Carluccio, Ronald: *See*—
Antonacci, Frank; and Carluccio, Ronald, 270,192, Cl. D28-13.000.
Champion Spark Plug Company: *See*—
Grime, Thomas E., 270,179, Cl. D23-17.000.
Grime, Thomas E., 270,180, Cl. D23-18.000.
Child, Francis W. Pedicure implement. 270,198, 8-16-83, Cl. D28-59.000.
Chuboff, David P.: *See*—
Boldt, Melvin H.; Chuboff, David P.; Franek, Wayne J.; and Johnson, Marilyn M., 270,157, Cl. D14-63.000.
Combs, Robert L.: *See*—
Whitehouse, Martin H.; and Combs, Robert L., 270,187, Cl. D25-74.000.
Compagnie Generale des Etablissements Michelin: *See*—
Grenie, Philippe, 270,150, Cl. D12-147.000.
Cox, John A., to Liqui-Box Corporation. Plastic container for liquids. 270,136, 8-16-83, Cl. D9-350.000.
Craig, Bradley M. Hold down device for a beach blanket or similar article. 270,133, 8-16-83, Cl. D8-388.000.
Creske, E. J. Waste receptacle. 270,200, 8-16-83, Cl. D34-7.000.
Crespi, Gabriella. Table or similar article. 270,114, 8-16-83, Cl. D6-27.000.
Dale, William T., to Seibel, Charles M. Airplane main landing gear-strut and wheel pants cover. 270,152, 8-16-83, Cl. D12-345.000.
Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 270,128, 8-16-83, Cl. D6-191.000.
Eli Lilly and Company: *See*—
Rosen, Marc A., 270,138, Cl. D9-405.000.
Elliott, Randall L.; and Pickel, James A., to Liberty National Bank & Trust Co. Kiosk for automatic banking or the like. 270,203, 8-16-83, Cl. D99-28.000.
Falborn, James A.: *See*—
Stoute, Neville; and Pennise, Robert J., 270,134, Cl. D9-305.000.
Faust, Frederick R. Trailer enclosure. 270,147, 8-16-83, Cl. D12-102.000.
Flanagan, Robert M., to Amerace Corporation Snowplowable roadway marker. 270,143, 8-16-83, Cl. D10-113.000.
Ford, John M. B.: *See*—
McDonald, John W.; and Ford, John M. B., 270,137, Cl. D9-376.000.
Fossella, Gregory; and MacDonald, J. B., to Hazeltine Corporation. Computer terminal. 270,158, 8-16-83, Cl. D14-106.000.
Fox, E. Stuart. Taco serving tray. 270,130, 8-16-83, Cl. D7-38.000.
Franek, Wayne J.: *See*—
Boldt, Melvin H.; Chuboff, David P.; Franek, Wayne J.; and Johnson, Marilyn M., 270,157, Cl. D14-63.000.
Gaines, Henry F. Mole trap. 270,174, 8-16-83, Cl. D22-18.000.
Gates, Robert D. Dual compartment portable container. 270,135, 8-16-83, Cl. D9-341.000.
Gillette Company, The: *See*—
Gray, Michael J., 270,195, Cl. D28-46.000.
Gray, Michael J.; and Trotta, Robert A., 270,196, Cl. D28-48.000.
Gray, Michael J., 270,197, Cl. D28-48.000.
Govenius, Rainer, to Mediman Ky. Suction head for dental use. 270,183, 8-16-83, Cl. D24-10.000.
Gray, Michael J., to Gillette Company, The. Razor. 270,195, 8-16-83, Cl. D28-46.000.
Gray, Michael J.; and Trotta, Robert A., to Gillette Company, The. Razor handle. 270,196, 8-16-83, Cl. D28-48.000.
Gray, Michael J., to Gillette Company, The. Razor handle. 270,197, 8-16-83, Cl. D28-48.000.
Greene, Daniel H.; and Greene, Lawrence J. Finger-mounted remedial reading aid. 270,169, 8-16-83, Cl. D19-59.000.
Greene, Lawrence J.: *See*—
Greene, Daniel H.; and Greene, Lawrence J., 270,169, Cl. D19-59.000.
Grenie, Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 270,150, 8-16-83, Cl. D12-147.000.
Grime, Thomas E., to Champion Spark Plug Company. Spray gun. 270,179, 8-16-83, Cl. D23-17.000.
Grime, Thomas E., to Champion Spark Plug Company. Spray gun. 270,180, 8-16-83, Cl. D23-18.000.
Haapala, Ray. Combined row marker and string cleat. 270,132, 8-16-83, Cl. D8-1.000.
Haas, David J., to North American Philips Corporation. X-Ray inspection cabinet. 270,181, 8-16-83, Cl. D24-02.000.
Hanyu, Susumu; and Yuasa, Kenzo, to Janome Sewing Machine Co. Ltd. Carrying handle for sewing machine. 270,159, 8-16-83, Cl. D15-72.000.
Harbutt's Plasticine Limited: *See*—
Kay, Robert, 270,162, Cl. D15-135.000.
Harris, Jack E.: *See*—
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,201, Cl. D34-29.000.
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,202, Cl. D34-29.000.
Hassman, Mina F. Pug nose troll. 270,172, 8-16-83, Cl. D21-166.000.
Hazeltine Corporation: *See*—
Fossella, Gregory; and MacDonald, J. B., 270,158, Cl. D14-106.000.
Heck, Michael E., to Berkan-Heck Company. Irrigation sprinkler. 270,178, 8-16-83, Cl. D23-7.000.
Hitachi, Ltd.: *See*—
Ohnuma, Mitsuru; Toyoda, Fumio; and Tsuburaya, Kazuyuki, 270,154, Cl. D14-1.000.
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., to Rexnord Inc. Conveyor module. 270,201, 8-16-83, Cl. D34-29.000.
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., to Rexnord Inc. Conveyor module. 270,202, 8-16-83, Cl. D34-29.000.
Hoey, Fred A., to C. Bruno & Son, Inc. Drum lug. 270,167, 8-16-83, Cl. D17-22.000.
Hor, Kok K. Egg cooker. 270,131, 8-16-83, Cl. D7-355.000.
Horton, Charles M.: *See*—
Aulbert, Harold V.; and Horton, Charles M., 270,124, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M., 270,125, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M., 270,126, Cl. D6-154.000.
Aulbert, Harold V.; and Horton, Charles M., 270,127, Cl. D6-164.000.
Ichikawa, Matsuo, to Ichikawa Press Industry Co., Ltd. Fog light. 270,190, 8-16-83, Cl. D26-28.000.
Ichikawa Press Industry Co., Ltd.: *See*—
Ichikawa, Matsuo, 270,190, Cl. D26-28.000.
Iurcovich, Natan L. Armchair. 270,115, 8-16-83, Cl. D6-31.000.
Iurcovich, Natan L. Chair. 270,117, 8-16-83, Cl. D6-67.000.
Jack Light Industrial Company Limited: *See*—
Bluemel, Peter E., 270,109, Cl. D2-27.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu; and Yuasa, Kenzo, 270,159, Cl. D15-72.000.
Janusz, Michael J. Set of game playing pieces. 270,171, 8-16-83, Cl. D21-52.000.
John Manufacturing Limited: *See*—
Se-Kit, Yuen, 270,199, Cl. D28-78.000.
Johnson, Marilyn M.: *See*—
Boldt, Melvin H.; Chuboff, David P.; Franek, Wayne J.; and Johnson, Marilyn M., 270,157, Cl. D14-63.000.

Jones, Richard E., to Byrne & Davidson Doors (NSW) Pty. Limited. Metal section. 270,186, 8-16-83, Cl. D25-74.000.
Kay, Robert, to Harbutt's Plasticine Limited. Extrusion moulding apparatus. 270,162, 8-16-83, Cl. D15-135.000.
Khoo, Tian. Brick. 270,189, 8-16-83, Cl. D25-80.000.
Klein, Derren A. Combined comb and pen. 270,193, 8-16-83, Cl. D28-25.000.
Kwan, Gerald A.: *See—*
Wooten, Ronald E.; and Kwan, Gerald A., 270,185, Cl. D25-74.000.
Lam, Philip Y. Combined digital wrist watch and thermometer. 270,141, 8-16-83, Cl. D10-31.000.
Laux, John. Feed extension for milling machine. 270,161, 8-16-83, Cl. D15-131.000.
Liberty National Bank & Trust Co.: *See—*
Elliott, Randall L.; and Pickel, James A., 270,203, Cl. D99-28.000.
Liqui-Box Corporation: *See—*
Cox, John A., 270,136, Cl. D9-350.000.
Logan, Duane A. Hair comb. 270,194, 8-16-83, Cl. D28-30.000.
M/M Verdi International, Inc.: *See—*
Stark, Ted, 270,112, Cl. D3-77.000.
MacDonald, J. B.: *See—*
Fossella, Gregory; and MacDonald, J. B., 270,158, Cl. D14-106.000.
Marianelli, Giorgio: *See—*
Barbieri, Raul; and Marianelli, Giorgio, 270,191, Cl. D27-29.000.
McDonald, John W.; and Ford, John M. B., to Realex Corporation. Dispensing container for liquids. 270,137, 8-16-83, Cl. D9-376.000.
McPherson, Mathew, Sr. Musical instrument support bracket. 270,120, 8-16-83, Cl. D6-114.000.
Mediman Ky: *See—*
Govenius, Rainer, 270,183, Cl. D24-10.000.
Melchior, Merle C., to Pacific Furniture Manufacturing Co. Sofa. 270,116, 8-16-83, Cl. D6-63.000.
Migdow, Ben R. Gym shoe. 270,111, 8-16-83, Cl. D2-309.000.
Moore, Adrienne; and Zweiback, A. Martin. Face mask. 270,110, 8-16-83, Cl. D2-234.000.
Morawski, Janusz. Hanger. 270,129, 8-16-83, Cl. D6-247.000.
Nippon Kogaku K.K.: *See—*
Tomatsuri, Masakazu; and Suyama, Hitoshi, 270,166, Cl. D16-133.000.
North American Philips Corporation: *See—*
Haas, David J., 270,181, Cl. D24-02.000.
Ogawa, Yoshio, to Sony Corporation. Typewriter. 270,168, 8-16-83, Cl. D18-1.000.
Ohnuma, Mitsuru; Toyoda, Fumio; and Tsuburaya, Kazuyuki, to Hitachi, Ltd. Video disk player. 270,154, 8-16-83, Cl. D14-1.000.
Ohtsu Tire & Rubber Co., Ltd., The: *See—*
Shinomiya, Masami, 270,148, Cl. D12-136.000.
Pacific Furniture Manufacturing Co.: *See—*
Melchior, Merle C., 270,116, Cl. D6-63.000.
Pendelfin Studios Limited: *See—*
Roberts, Derek H., 270,146, Cl. D11-158.000.
Pennise, Robert J.: *See—*
Stoute, Neville; and Pennise, Robert J., 270,134, Cl. D9-305.000.
Pickel, James A.: *See—*
Elliott, Randall L.; and Pickel, James A., 270,203, Cl. D99-28.000.
Pro-Tec, Inc.: *See—*
Burns, Dennis L., 270,165, Cl. D16-117.000.
Produits de Beaute Lancaster: *See—*
Ballereaud, Pierre, 270,139, Cl. D9-435.000.
Realex Corporation: *See—*
McDonald, John W.; and Ford, John M. B., 270,137, Cl. D9-376.000.
Rexnord Inc.: *See—*
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,201, Cl. D34-29.000.
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,202, Cl. D34-29.000.
Rhodenbaugh, William C. Dispenser. 270,119, 8-16-83, Cl. D6-95.000.
Roberts, Derek H., to Pendelfin Studios Limited. Sculpture. 270,146, 8-16-83, Cl. D11-158.000.
Rosen, Marc A., to Eli Lilly and Company. Bottle. 270,138, 8-16-83, Cl. D9-405.000.
Sawada, Masaji, to Sharp Corporation. Electrostatic copying machine. 270,164, 8-16-83, Cl. D16-31.000.
Scholz, Donald T. Speaker volume control. 270,153, 8-16-83, Cl. D14-1.000.
Schroeder, Roger H.: *See—*
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,201, Cl. D34-29.000.
Hodlewsky, William G.; Harris, Jack E.; and Schroeder, Roger H., 270,202, Cl. D34-29.000.
Schwartz, Frederick W., to Cable Electric Products, Inc. Battery tester. 270,142, 8-16-83, Cl. D10-77.000.
Se-Kit, Yuen, to John Manufacturing Limited. Illuminated compact. 270,199, 8-16-83, Cl. D28-78.000.
Seibel, Charles M.: *See—*
Dale, William T., 270,152, Cl. D12-345.000.
Sharp Corporation: *See—*
Sawada, Masaji, 270,164, Cl. D16-31.000.
Shimizu, Y., to Arrow Trading Co., Inc. Combined telephone housing and handset therefor. 270,155, 8-16-83, Cl. D14-53.000.
Shimizu, Y., to Arrow Trading Co., Inc. Telephone. 270,156, 8-16-83, Cl. D14-56.000.
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Wood, Reginald, 270,118, Cl. D6-85.000.
Technicare Corporation: *See—*
Wagner, Kenneth, 270,182, Cl. D24-02.000.
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ISSUED AUGUST 16, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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334 4,398,756

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465 4,399,377

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235 4,398,778

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212 4,398,838

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302 4,398,851

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CLASS 407

104 4,398,853

CLASS 408

185 4,398,854

CLASS 411

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CLASS 412

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271 4,399,224

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519 4,399,229

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8 4,398,895

CLASS 445

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260 4,399,560
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327 4,399,562
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106 4,399,283
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	77	270,142
	113	270,143
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	136	270,148
	146	270,149
	147	270,150
	327	270,151
	345	270,152
D14—	1	270,153
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	53	270,155
	56	270,156
	63	270,157
	106	270,158
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	131	270,161
	135	270,162
	145	270,163
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	80	270,189
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06 : 270,110
270,116
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270,169
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09 : 270,151

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